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ADEQUATE FOREST FIRE PROTECTION by federal, state, and other agencies, individually and in cooperation; the REFORESTATION OF DENUDED LANDS, chiefly valuable for timber production or the protection of stream-flow; more extensive PLANTING OF TREES by individuals, companies, municipalities, states and the federal government; the ELIMINATION OF WASTE in the manufacture and consumption of lumber and forest products; the advancement of SOUND REMEDIAL FOREST LEGISLATION.

The ESTABLISHMENT OF NATIONAL AND STATE FORESTS where local and national interests show them to be desirable; the CONSERVATIVE MANAGEMENT OF PUBLIC AND PRIVATE FORESTS so that they may best serve the permanent needs of our citizens; the development of COMMUNITY FORESTS.

FOREST RECREATION as a growing need in the social development of the nation; the PROTECTION OF FISH AND GAME and other forms of wild life, under sound game laws; the ESTABLISHMENT OF FEDERAL AND STATE GAME PRESERVES and public shooting grounds; STATE AND NATIONAL PARKS and monuments where needed, to protect and perpetuate forest areas and objects of outstanding value; the conservation of America's WILD FLORA and FAUNA.

The EDUCATION OF THE PUBLIC, especially school children, in respect to our forests and our forest needs; a more aggressive policy of RESEARCH AND EDUCATIONAL EXTENSION in the science of forest production, management, and utilization, by the nation, individual states, and agricultural colleges; reforms in present methods of FOREST TAXATION, to the end that timber may be fairly taxed and the growing of timber crops increased.

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AMERICAN FORESTS AND FOREST LIFE invites contributions in the form of popular articles, stories and photographs dealing with trees, forests, reforestation, lumbering, wild life, hunting and fishing, exploration or any of the many other activities which forests and trees typify. Its pages are open to a free discussion of forest questions which in the judgment of the editor will be of value in promoting public knowledge of our forests and their use. Signed articles published in the magazine do not necessarily reflect the views of the Association. Manuscripts must be accompanied by return postage. Editorial and Publication Office, The Lenox Building, 1523 L Street, Washington, D. C.

Photograph by courtesy of the New York State Conservation Commission

TAHAWUS*

Monarch of the Great North Woods---
Thou towering giant---
To tempests past and those to come
Calmly defiant,
I envy thy disdain of fret
And life grows shoal
As thy august placidity
Rebukes my soul.

---William O. Seeman.

*Cleaver of Clouds—the Indian name for Mt. Marcy.

AMERICAN FORESTS

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Plantations as Game Preserves

By ARCHIBALD RUTLEDGE

I STOOD on the bank of the Santee River, on a high bluff overlooking that great stream, and before me saw the mighty delta of that lonely country. Thousands of acres of marshland, of reedy morasses, of mouldering cypress swamp gleamed in the placid sunshine. And over it all was that solitary spirit that rests not on those places that man has never inhabited, but rather on those that he has known and loved, and has now abandoned. The immense region in question is a waste country. Formerly, stately white plantation homes glimmered from these banks; and in the huge rice fields negroes toiled and sang in the rice. But now all is changed. The homes have, almost without exception, been destroyed accidentally by fire. The intricate system of ditches and dykes in the low-lying fields has almost disappeared. The negroes are but a handful of what they were. A whole civilization has vanished. But the country is there; and the wild life is there.

The immense coastal plain of the Carolinas, of Georgia, and of all the Gulf States presents a similar situa-

FORMERLY STATELY WHITE PLANTATION HOMES GLIMMERED FROM THESE BANKS, AND IN THE HUGE RICE FIELDS NEGROES TOILED AND SANG. BUT NOW ALL IS CHANGED—CIVILIZATION HAS VANISHED—THE COUNTRY IS THERE AND THE WILD LIFE IS THERE, FOR NATURE RECLAIMS WHAT MAN ABANDONS

tion. Hundreds of plantations have reverted to their wild state. When the big timber is cut, they revert to a still wilder state; for usually, with a semitropical fecundity of growth, bushes and vines run riot over the young trees, falling in vast emerald tapestries to the ground, only to form incredible green carpets, clothing the very earth with lustrous foliage. The condition of abandonment by man which I describe as obtaining in the Santee country is therefore not exceptional, but may be taken as a general result of the Civil War, with its consequent revolutionizing of the whole social structure of life in the South. Whether the country in question borders on the Santee or the Pedee, the Waccamaw or the Savannah, the Mobile or the Mississippi, the general result is pretty much the same: the abandonment of much land to the care of Nature, and to the occupancy of her timid wild children.

I AM ON AN OLD RUINED BANK—A BANK SO OLD THAT FULL-GROWN TREES ARE STANDING ON IT, WITH VAST TAPESTRIES OF SOFT GRAY MOSS FALLING TO THE GROUND

For many years I have come to believe that a deserted plantation is an ideal place for game; and I know of scores of instances in which such places have been turned into ideal preserves. Perhaps the best way in which to make my meaning clear is to give instances of my own experiences with game on certain of these lonely tracts. My purpose in recording these observations is merely to demonstrate that the desertion of a place by man has, in a broad sense, its advantages; and that though he may no longer live there, he may return there, and with delight discover what good use wild things are making of his property. The longer one lives close to Nature, the more convinced one becomes that there is really no such thing any more as waste land. Nature and her children always are ready to retake what we abandon.

It is four o'clock of a December afternoon, with a wind stealing down out of the north with an icy chill. In the west are lurid sunset clouds, stormy and beautiful. I am on an old ruined bank that spans the Santee delta,—a bank so old that full-grown trees are standing on it. Indeed, their presence is what really keeps the old dyke in place. Southward I face, for it is from the river-mouth, eight miles away, that the evening flight of wild-ducks will come; and since the evening is cold and windy, the ducks will be in early.

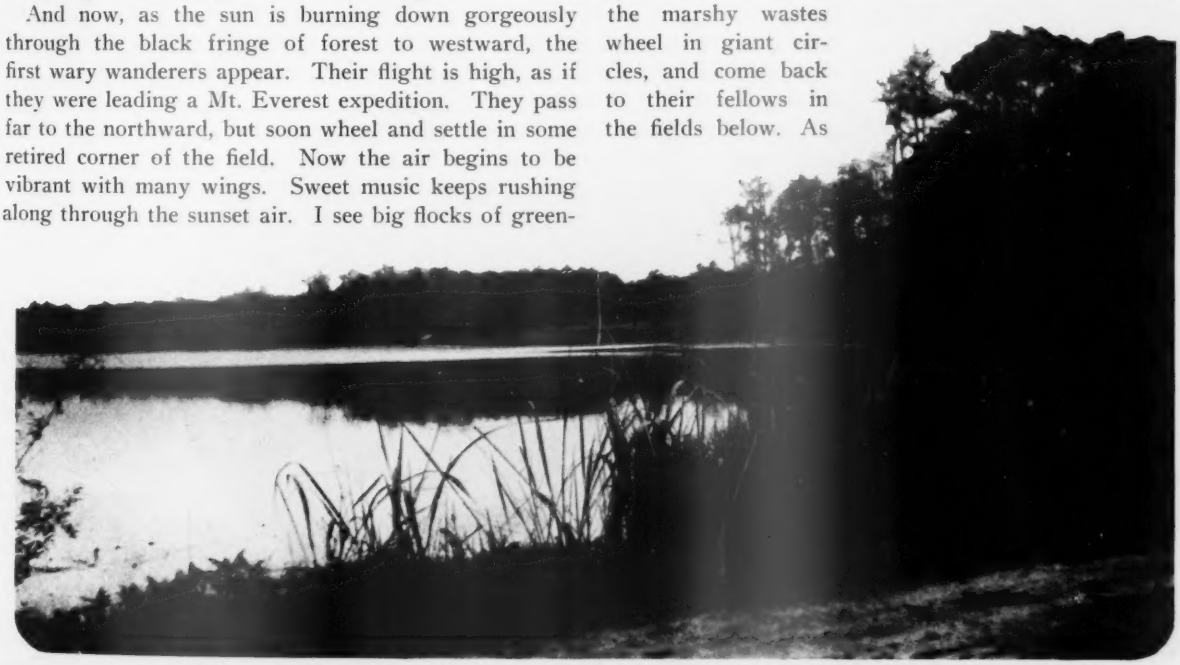
The daily routine of these wintering wild fowl has always been of intense interest to me. From their arrival in late October until their departure in March it varies little. It is this: coming to the delta fields in the late afternoon, they spend the night there. Early in the morning they repair to the seacoast; sometimes to the quiet sea-island ponds, hidden away in the dense

SUDDENLY THE AIR IS VIBRANT WITH MANY WINGS—THE WILD FOWLS POUR IN—THE DUCKS IN THE FIELD CALLING JOYOUSLY TO THOSE IN THE HEAVENS AS THEY CIRCLE LOW IN THE TWILIGHT, INTENT ON FINDING A PLACE TO LIGHT AND REST FOR THE NIGHT

forests of pine and red cedar; sometimes to the vast sea-marshes, whose winding creeks offer many a warm and sheltered reach; sometimes to Bird Bank, off the coast, where they bask in the sunshine on the almost tropical strand, or sport in the placid waters in the lee of the lonely shoal. Of course, if the weather is stormy, they may be tempted to stay in the old reed-hung creeks of the delta all day. But in general they make these regular morning and afternoon flights.

And now, as the sun is burning down gorgeously through the black fringe of forest to westward, the first wary wanderers appear. Their flight is high, as if they were leading a Mt. Everest expedition. They pass far to the northward, but soon wheel and settle in some retired corner of the field. Now the air begins to be vibrant with many wings. Sweet music keeps rushing along through the sunset air. I see big flocks of green-wing teal speeding on incredibly swift wings, veering in concert, righting themselves in exact formation, and dashing on in wild and perfect flight. I don't know how a hundred teal, going at cyclone speed, can manage to execute some of their aerial maneuvers.

Now come the wood-ducks, their piercing sweet cries identifying them. They always fly closer to the river than the others. Now the sky is darkening with the coming of the mighty host. As far as I can see, "in squares and squadrons and right-ranks of war" the vast multitude of wild fowl pours in, until the mind is bewildered, and the eye is baffled. Here I see six hundred mallards beating in,—a huge spear-head, black against the rosy sky. A hundred black ducks wheel above me, tip their wings upward, and their feet downward, and settle in a plowed field not a hundred yards from where I stand. Pintails and shovelers, pidgeons and blackheads, ruddy ducks and gadwalls,—down they pour. The quacking is incessant and jovial and almost deafening. The ducks in the fields call joyously to those in the heavens, which slant their flight toward their clamoring comrades. The flocks that have overflown the marshy wastes wheel in giant circles, and come back to their fellows in the fields below. As



ON THE DUCKING GROUNDS. A DESERTED PLANTATION IS AN IDEAL PLACE FOR GAME, AND MANY SUCH PLACES ARE BEING TURNED INTO PRESERVES

the twilight deepens, the ducks fly much lower, intent only on finding a place to light, and to find it fast. The flight is over as the stars begin to wink timidly from the velvet sky. But I can hear the lordly expanse of delta country literally seething with wild fowl, feasting on wild rice, on wampee, on lotus, and on waterlily-roots and bulbs. It is a heartening sight for the lover of wild life to see today such a spectacle as the incoming hosts of ducks into these waste fields of the deserted Southern plantations. But the abandoned country of which I speak harbors nobler game than wild fowl. On this same delta wild turkeys range in fine flocks—I have counted one of thirty-five; and so dense is the cover and so precarious the footing for the hunter, that they are practically safe from man. Indeed, the wild turkeys that breed on the pinelands of the plantations adjacent to the river, and that forage in the autumn through the sparkleberry thickets and under the huge live-oaks of the plantation region, have a habit of flying across the river, as soon as the hunting season opens, to take refuge on the inviolate delta. The wetness of the delta disturbs them not at all. I have watched flocks busily foraging on the brimming edges of freshet tides; and have killed more than one of these great birds that had his legs stained with red river-mud up to his knees. When a flood submerges the delta, the turkeys repair to certain high pine ridges to await the subsiding of the waters; and if these ridges are covered, they either live in the trees, or else fly to the mainland. One of the most impressive wild-life sights I ever witnessed was the flight of a huge gobbler over the drowned delta. Launching himself from the crest of a mighty yellow pine, he beat his way powerfully over the stormy tide, a lone illustrious figure against the lonely sky,—driving on with incredible momentum until he reached the great pine forest on the mainland, a full mile from the pine whence he had taken off. I have seen wild turkeys swim in the freshet-tide. Some naturalists ridicule the idea that a turkey will swim. But, upon surprising these great birds on a ridge above the flood, I have seen some of them skulk into the water, and swim away between the tree-trunks, looking remarkably like huge marsh-hens. I do not think they are expert swimmers; nor do I think they employ this method of escaping an enemy unless, under the circumstances, they think it the best one possible. All wild things will do likewise. I have known a fox, closely pressed, to swim a creek; and I have seen a wildcat plunge boldly into a river when I thought that two of my airedales surely had him cornered. By far the noblest form of wild life that finds a home on the old plantations is the whitetail deer,—perhaps the best beloved of all our big game animals. Since earliest boyhood I have hunted deer in those regions, both with a gun and without one; for I used to ride the woods a great deal after stock, and that kind of work often gives a man an unusually fortunate opportunity to observe the wild life of the country he traverses. It has always seemed to me that if a whitetail has a place into which

DEER ARE ABUNDANT AND CONSTANTLY HUNTED. THIS IS A RECORD HEAD FROM THE COAST REGION

BOTH ON THE DELTA AND THE PLANTATIONS THE COVER FOR DEER IS IDEAL—VAST MARSHES, DENSE CANEBRAKES, LONELY SWAMPS OR REEDY WASTES FURNISH INVIOLATE NATURAL SANCTUARIES

he can skulk when he is in danger, he can hold his own pretty well against man; for this deer is essentially a skulker. Gifted as a jumper, a runner, and a swimmer, his real forte is dodging. Both on the delta and the plantations the cover for him is ideal. On the delta he has vast inviolate marshes into which he can serenely retire; he has dense canebrakes into which he can insinuate himself with the eerie grace that is his; there are deep and lonely swamps, reedy wastes almost as discouraging to the hunter as the papyrus thickets along the Nile. No wonder that there are plenty of deer on the delta; nor any less wonder that few are killed. The bucks there attain a burliness of stature and of horn-architecture that one naturally associates with the whitetail of the wildest regions. I have seen horns from the delta that would favorably compare with any I ever saw from Maine, Texas, Pennsylvania, or Michigan. For example, I have seen the antlers of a 26-pointer, with a spread of 24¾ inches, massive and craggy almost beyond belief.

A MAGNIFICENT AVENUE OF LIVE OAKS ON AN ABANDONED PLANTATION—SUGGESTIVE OF THE BEAUTY OF THE GROUNDS OF THOSE STATELY PLANTATION HOMES OF THE SOUTH OF LONG AGO

On the plantations proper, on the mainland, deer have always been abundant; and though since the earliest years of settlement they have been hunted, their numbers do not apparently diminish. Their survival is not due to a lack of zeal in their pursuit on the part of sportsmen, but rather to the presence in that region of certain inviolate natural sanctuaries into which the deer, almost as soon as roused, try to make their escape. A country also of rivers and creeks and big woodland lakes, it is no difficult thing for a stag to elude his pursuers by crossing water. Certain swamps are really impenetrable in the ordinary sense; and I know at least one near my home into some parts of which no human foot has ever been set,—unless, ages ago, some wandering Seminole invaded its mysterious fastness.

In this region deer-hunting has existed so long that, with hunters of the fourth and fifth generation, who have the thing really in their blood, deer-hunting is something of a religious rite. Overlooking the mere

(Continued on page 618)

The Ownership of Boundary Line Trees

By Leo T. Parker

PROPERTY owners, generally, are not informed of their legal rights regarding trees and shrubbery which stand on a boundary line. A review of some of the leading cases on this subject will be both interesting and informative to them.

In view of numerous past decisions, the law is well established that trees and shrubbery which grow on a boundary line are the common property of both of the owners of the adjoining land, and neither is at liberty to cut them down without the consent of the other. (77 Atl. 964.) However, either owner is at liberty to cut off limbs extending over his land from the trunk of a tree, but in doing so he must exercise precaution not to cause unnecessary injury to the main body of the tree. (65 Conn. 365.)

A very common source of litigation is where a property owner gives permission to his neighbor to plant trees or shrubbery on the boundary line, and then later desires to have them removed. For instance, in a quite recently decided case (100 N. W. 329) it was disclosed that a property owner obtained permission from an adjoining land owner to plant a hedge on the boundary line. The owner who planted the hedge verbally agreed to trim and otherwise maintain it in a neat condition. In later years, however, the hedge grew tall and bushy, and remained untrimmed for considerable periods. The property owner who had permitted his neighbor to plant the hedge instituted legal proceedings to compel the latter to remove it from the boundary line. The Court held that since the hedge was the common property of the two adjoining land owners, neither was legally entitled to compel the other to dig it out or destroy it, although it had become a nuisance, irrespective of the original verbal agreement between the two parties.

In still another leading case (130 Atl. 27) it was shown that two adjoining land owners contributed equal amounts of money and labor toward planting trees on the boundary line. In later years the roots of the trees spread in such proportions that serious damage resulted to one of the property owners. This owner attempted to obtain the consent of the other property owner to cut down the trees, but was refused the privilege. He filed suit asking permission of the Court to remove the trees alleging that great damage was being effected by their roots and, further, that the standing trees were valueless both to himself, and the owner of the adjoining land.

However, the Court refused to issue an order granting permission to remove the trees without mutual consent of both of the adjoining land owners, and in effect, said that the mere fact that trees standing on a boundary line are nuisances is not sufficient reason for the Court to grant power to one of the owners to remove them. This Court explained further that either of the property owners would be within their legal rights in cutting the limbs and roots which intrude over the land.

Another common source of litigation is where the trees or shrubbery stand *near* a boundary line, and their roots and branches extend over the land of the adjacent property owner. In a leading case (79 Atl. 883), where this point of the law was involved, the higher Court held that where the branches of trees or shrubbery which overhang the adjoining property legally are deemed a nuisance, the property owner on whose land they grow is liable in damages to the adjoining owner.

In another case (77 Mo. App. 262) a property owner instituted legal proceedings to compel an adjoining land owner to cut down trees whose branches extended over the property line. The Court held that the sole recourse of the complaining property owner was to file suit for damages against the owner of the trees, or that he was at liberty to eliminate the nuisance by cutting off the limbs to the boundary line. A property owner may obtain an injunction compelling an adjoining owner to cut down trees or shrubbery only where convincing testimony is introduced which proves to the satisfaction of the Court that the nuisance effects a material injury which cannot be prevented by cutting off the overhanging branches or intruding roots.

For illustration, in a recent case the Court refused to compel a property owner to cut down shade trees where an adjoining owner testified that the continuous shade caused his house to remain damp. It is important to observe that while the law is well established that a property owner may legally cut off the overhanging branches of trees which stand upon the adjoining land, yet in a leading case (25 N. Y. 126) a higher Court established the law and held a property owner liable in damages where it was shown that the latter plucked fruit from the branches which overhung his property.

In other words, a tree and its product is owned exclusively by the person on whose land its trunk stands, and where an adjoining property owner cuts off overhanging branches, he should deposit them upon the land of the owner. But under no circumstances may a property owner enter upon the adjoining land to cut or injure trees or shrubbery. A person who enters

(*Continued on page 637*)

Naming the Buckeye State

By Mildred G. Durbin

NOT long ago a Californian said: "I had always thought of Ohio as a state dotted with buckeye trees, among which the inhabitants roamed talking politics; but I have just driven five hundred miles in that State without seeing a buckeye tree or hearing politics mentioned."

He could have found a few hundred of these trees along the streams in the southern half of the State, but politics, even in Ohio, is seasonal. Yet less than a century ago there were thousands of buckeye trees, and these, together with a famous political campaign of that period gave to Ohio and its people forever the nickname of "Buckeye." Before white men came to Ohio, the Indians had named the buckeye trees. They thought the shiny, brown nut with its lighter brown spot looked like the eye of a male deer, so they called it Hetuck, which means Buckeye. In the dark, gloomy forests that almost covered the State, it was perhaps the most useful tree to the pioneer. As it grew only in very fertile soil, it guided him in his choice of land. Because of its softness, it was worthless for lumber; but the logs were light and easy to handle, and there was no danger of breaking his precious ax in the wood. For these reasons, he chose it for his first cabin. That it would endure for only a few years made no difference; by the time the logs decayed, his children would be big enough to help make home-made bricks for a brick house, or a saw mill would locate near, and he could have lumber sawed for a frame house.

NAMED BUCKEYE BY THE INDIANS BEFORE WHITE MEN CAME TO THE STATE, THIS TREE HAS MADE OHIO PEOPLE (AND POLITICS) FAMOUS AS "BUCKEYES" FROM COAST TO COAST IN SONG AND STORY

The buckeye logs burned too slowly to be useful for fuel, but for that reason they made fine back-logs in the fireplace.

As they may be easily hollowed out, they were used to make bowls for the kitchen and troughs for maple sap. Furniture stores were miles away, and thousands of pioneer babies were rocked in hollowed-out sections of buckeye logs.

Besides these uses of the logs, the buckeyes and the bark were used for medicines. Buckeyes were carried back East as curiosities, and as few of these trees were found outside of Ohio, they soon came to be associated in people's minds with that State.

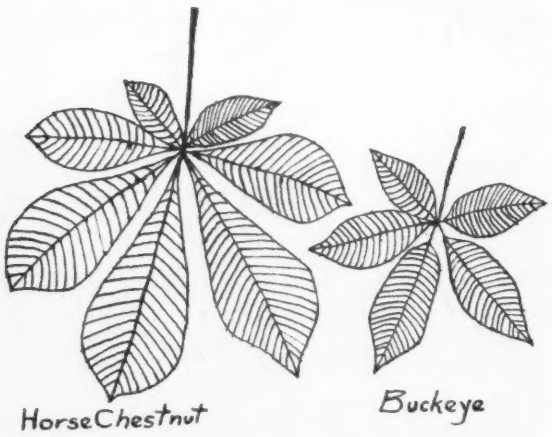
But Ohioans were not generally known as Buckeyes until after the Presidential campaign of 1840.

One of the candidates that year was Gen. William Henry Harrison. Following a military career in which the high spot was his victory of Tippecanoe, he retired to his large farm in southwestern Ohio. Choosing a beautiful spot overlooking the Ohio River, he built a double log-cabin which was covered with clapboards and painted white. Here the old General expected to enjoy the rewards of his strenuous life. But at that time, military heroes made desirable candidates, and he was chosen to head the Whig ticket. The other candidate was President Martin Van Buren. He had re-furnished the White House with beautiful, expensive furniture and was reputed in all things to be a follower of European customs. Two panics had swept the country. Wages were low. Money was scarce. Times were "hard." All these things made him unpopular with those voters who cleared a few acres of forest land every winter, planted crops among the stumps in the spring, and in the fall hauled the harvest several hundred miles over a nationally built pike to Baltimore, Maryland. To make matters worse, this pike needed repairs. The President said: "No more internal improvements at national expense."

The people wanted a change—not an unusual thing in American politics.

After General Harrison was nominated, an opposition newspaper remarked that he was better fitted to sit in a log-cabin and drink hard cider than to rule in the White House. This was enlarged upon by President Van Buren's friends.

The result was immediate turmoil among the people in the Alleghenies and to the west. "Thousands of good folks live in log-cabins," they said. "What's wrong



THESE DRAWINGS SHOW THE CHARACTERISTIC DIFFERENCE IN THE LEAVES OF THE OHIO BUCKEYE AND ITS ASIATIC COUSIN, THE HORSECHESTNUT

with that? Hard cider's all right. Let's get rid of this dude who cares nothing for us. No Ohio man has been President. Let's elect one."

Tiny log-cabins of every shape and form, reproductions of pioneer and frontier homes, symbolic of those vivid days of pushing the frontier of civilization ahead, were built in Ohio, mounted on wagons and hauled in every political parade or demonstration throughout the width and breadth of the State. Coon skins waved and flapped in the breezes on every side of the cabins, and a hearty, bearded frontiersman sat within drinking hard cider. Jolly partisans shouted this song:

"Oh where, tell me where
Was your buckeye cabin made?

'Twas built among the merry boys
Who wield the plough and spade,
Where the log-cabins stand.
In the bonnie buckeye shade."

"Oh what, tell me what is to be your cabin's fate?

We'll wheel it to the capital and place it there elate,
For a token and a sign of the bonnie Buckeye State."

Buckeye logs were used for these cabins—at first probably because they were light in weight. Their use continued because buckeyes soon stood for Ohio—General Harrison—strength—integrity—patriotism—"good times."

Hundreds of these logs were required for the scores of cabins and for the thousands of canes that were swung by the miles and miles of marchers who paraded to the tunes of catchy campaign songs. Not only Ohio wood-cutters and loggers were busy, but many were sent from Pennsylvania to Ohio for supplies of buckeye logs. Necklaces of the pretty brown buckeyes were worn by the girl marchers.

Soon the craze for parading spread to the East. Thousands who had never lived in log-cabins took up the Log-Cabin Cause. A hundred thousand people in a parade was not uncommon over the country.

President Van Buren's friends, looking on, tried to stem the tide. "Listen to reason" they shouted. "General Harrison seldom if ever drinks hard cider. He is well-to-do, and the clapboards and white paint clearly take his house out of the log-cabin class."

But their voices were drowned by the tread of marching feet and songs about Jolly Buckeye Boys, Hard Cider, Log-Cabins and the Hero of Tippecanoe. Only election day could stop the parades.

General Harrison was easily elected—Ohio was the Buckeye State—Ohioans were "Buckeyes."

Ohioans are proud of their nickname. To them it stands for something substantial and dependable as evidenced by the hundreds of mercantile, manufacturing and financial concerns in Ohio that use the word "Buckeye" in their names. And when the much-discussed reforestation project is finally carried out on the hills of southern Ohio, doubtless we shall hear some sentimental legislator demanding that among the sturdy oaks, maples and walnuts there shall be planted some economically worthless but sentimentally beloved buckeye trees.

A REPLICA OF THE OLD DOUBLE LOG CABIN, COVERED WITH CLAPBOARDS AND PAINTED WHITE,—THE SIMPLE HOME WHICH HARRISON BUILT FOR HIMSELF ON A LOVELY SPOT OVERLOOKING THE OHIO RIVER, AND WHICH CAME INTO FAME IN THE PRESIDENTIAL CAMPAIGN OF 1840 AS THE HEADQUARTERS OF THE "LOG CABIN CAUSE"

THE SKY-DUSTER AT WORK

Dusting a hemlock forest, infested with caterpillars, along the edge of a cliff in Peninsula State Park, Wisconsin,—a spectacular performance. Three hundred pounds of calcium arsenate were sprayed from the airplane in less than ten minutes.

Sky Dusting the Hemlocks

By S. B. Fracker and A. A. Granovsky

THE man who "couldn't see the forest for the trees" had the usual experience of everyone who has tried to see or do much in the woods on foot. That was the only way a piece of timber could be observed a few years ago unless a mountain was so located that it overlooked the landscape.

Airplanes are, therefore, especially adapted for forest work, and one new duty after another has been assigned to them. Aerial photographs are supplementing or even superseding cruiser's maps; fires are located by the aerial speeders, and areas of insect damage are discovered in the same way.

The writers have recently been connected with a project in which a plane was employed to save seven hundred acres of hemlock from impending destruction when no other conceivable human agency could have accomplished the purpose.

A little known leaf-eating caterpillar, the hemlock spanworm (*Ellopia fiscellaria*) had killed six million board feet of hemlock in 1925 on about twenty acres by stripping the leaves from the trees, and poisoning with an arsenical dust was the only way to save the remainder of the stand. The final results proved to be a complete success.

This work was done in Peninsula State Park, Door county, Wisconsin. The park consists of a peninsula of 3,733 acres, about six square miles, extending into the waters of Green Bay. Along the margin of most of the peninsula is a flat, twenty feet above the level of the bay, varying in width from a few feet to nearly one mile. Separating the flat from the rolling plateau, which constitutes most of the park, is a rocky bluff, varying in nature from a gentle slope in some sections to a vertical escarpment of more than 200 feet at other points.

Except for 900 acres of clearings, the entire area consists of forest—hemlock, balsam, maple, elm, poplar, white and red pine and white cedar are the most important trees. Few roads have been built through this area, as the park administration has specialized on the development of trails and bridle paths. This is of particular importance when it comes to insect control work, for it is entirely impracticable to use land machines for spraying or dusting except for narrow strips along the few roads.

Throughout the summer of 1925 the spanworms invaded the woods in enormous numbers, mating and laying eggs. But it was not until the eggs began to hatch, in 1926, that airplane dusting was decided upon. The value of the park clearly justified the expenditure of several thousand dollars for this purpose. Total loss could be anticipated unless the worms were destroyed. The closely related western hemlock looper in 1919 and 1920 had killed four hundred million board feet of high quality Douglas fir and western hemlock in Tillamook county, Oregon. At that time no control measures against such defoliation were believed to be practical.

The work began early in July and was completed in ten days. Calcium arsenate was sprayed from the air at the rate of twenty pounds to the acre. At first, there

was difficulty in releasing an amount as great as that desired, so the hemlock stands were divided into sections of from twelve to one hundred acres each and the pilot instructed to spread one load of 250 pounds of dust on each twelve acres. This worked out satisfactorily.

Airplane dusting is one of the most thrilling sights ever witnessed. From the tourist hotels across the harbor, a view of the tiny plane on the horizon, with its slender thread of trailing dust above the dark green forest, was sensational. To the writers, repeatedly under or near the plane, the sight never failed to stimulate enthusiasm.

A CLEAN JOB

A little known leaf-eating caterpillar, the hemlock spanworm, killed six million board feet of hemlock on twenty acres in Wisconsin before sky dusting was attempted. The undergrowth as well as the trees were stripped.

One would be standing in a small clearing when the low drone of the motor would be heard. This would rapidly increase to a throbbing roar, and suddenly the plane would shoot into sight close over the tops of the trees, releasing a cloud of dust like a comet's tail. Crossing immediately overhead with a deafening rush, it would just clear the forest on the other side of the open space and the sound would die away, to increase again a few moments later as the flyer returned.

From the observation towers one watching the plane could not but admire the dexterity of the pilot, his daring and ability, and the confidence with which his unsupported steed was maneuvered over the hills and between the occasional tall pines. The writers were passengers in the plane later, but even the remarkable view of the forest below did not arouse an emotion equal to the sight of the plane as it roared over the treetops.

Sixty-three flights were made, with loads varying from 200 to 300 pounds. Each round trip, including loading, required approximately fourteen minutes. The plane flew 252 miles while actually dusting, about 100 miles while turning around after each strip, and over 500 miles from and to the landing field.

In the forest, checking the areas covered offers serious difficulties and is so slow and laborious that a complete check while the work is progressing is almost impossible. In addition to comparing notes with the pilot and then studying the dust distribution on the leaves, a method of following his work in the air was devised. This consisted of a crude plane-table plan, by which one observer in each of the two towers overlooking the area recorded the place of beginning and ending of dust release for each strip by drawng a line on the map from his tower through the point to be recorded. The intersection of the lines when the two maps were compared indicated where the work was done. Only those who have tried it realize the difficulty in following the location of a plane from a single observation point. Such observations are necessary, however, for the work cannot be completely checked on foot because strip-scouting, 715 acres at intervals of one rod would require walking more than 350 miles.

The best method for the determination of the mortality of the larvae was found to be the use of square-yard pieces of muslin. Many such pieces of cloth were gently placed on the ground under hemlock trees of different sizes three days before dusting and in different densities of forest to determine the mortality before, if any, and after the dusting. The height of the trees was recorded in order to estimate the relative area from which the larvae fell on the muslin. Approximately the same size twigs in the vicinity of these stations were shaken to determine the infestation before dusting. It is interesting to note that not in a single instance before dusting were dead worms found. The worms continued to die for five to eight days, but most of the larvae died between twenty-four and seventy-two hours after the dusting. In some instances as many as ninety-seven dead larvae fell on the ground per square yard.

It is estimated that in a solid hemlock stand the mortality was between ninety and ninety-five per cent, and in the mixed forest not less than eighty per cent. In two small plots consisting of young hemlocks overtopped by deciduous trees, which were dusted just before a rain, the apparent results were somewhat less than expected,

(*Continued on page* 640)

Exploded Wood

Wherein the "Practical" Theory that Waste is Waste in a Sawmill and There's Nothing to be Done About It Is Also Exploded

By Erle Kauffman

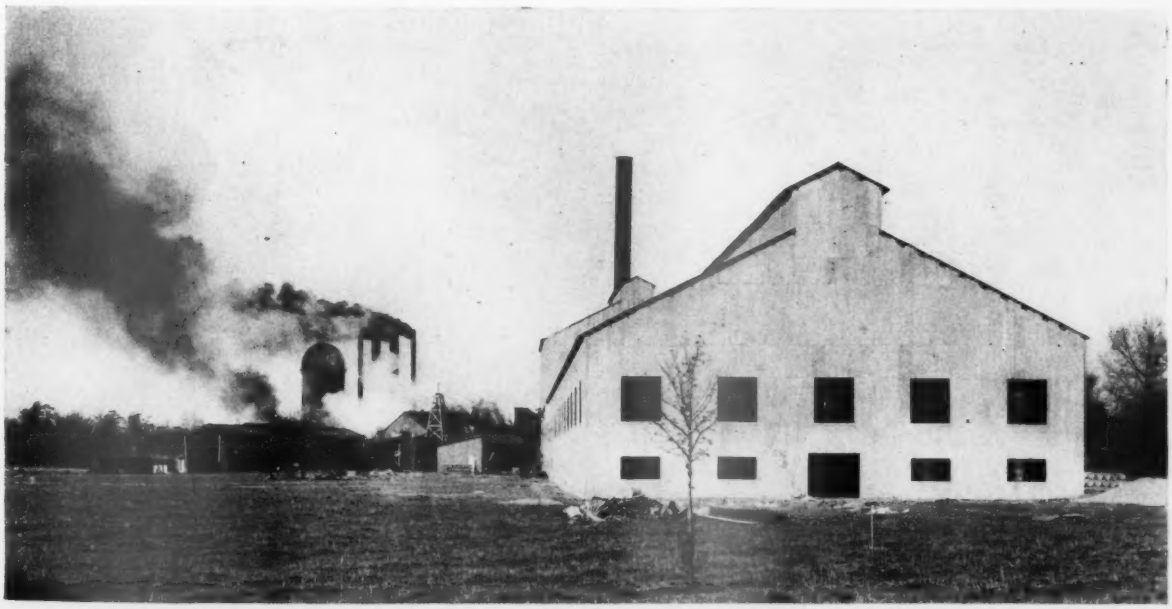
IT IS the peak hour in a great southern sawmill; silvery saws drone heavily as they labor; men stand vividly alert at their stations; foremen hurry to and fro; all is noise and action and screaming speed.

To the whine of the band saws, fresh clean lumber, cut to required dimensions, flows out upon the automatic carriage and passes to the cut-off saws. Immediately below the carriage, a giant leather and metal conveyer moves cautiously but endlessly, catching a continuous stream of slabs, board ends, edgings and sawdust thrown out from the busy saws. To the casual observer or even to the old time sawmill man, this river of waste seems insignificant and irreparable —a loss that just naturally can not be prevented. Mentally, he condemns it to the fury of a furnace blast or a waste burner and passes on.

But every few minutes a deafening clatter and hissing of steam assails the ear, subsiding to a more or less gentle din as the giant saws bite into a new log. An inquiring look at the foreman brings information, with a tolerant smile, that it is only "the gun." You stare at him blankly, possibly with righteous suspicion, and wonder in the meantime if you have been sized up as a greenhorn and are being "taken for a ride."

But the foreman is quite sincere. Within a hundred yards from where you stand the mill waste that you look upon as a nuisance is being fed into guns and blown into smithereens at a velocity of four thousand feet per second. After this amazing revelation you are told that the exploded wood fiber is transformed back into lumber in the astonishing time of forty-five minutes, or about one hour from the time it leaves the sawmill waste.

Suddenly you are staggered at the enormity of wood in these jagged slabs and edgings pouring in an endless stream from the mill. You are told that the immense plant before you is turning out more than a million and a half square feet of wood products from mill waste every month, one third of its capacity. You are given still further respect for this waste when informed that only one-third of it ever gets as far as the guns; that at least two-thirds is used for fuel, and that when the economy of other forms of power is determined, substantially all of the mill waste will be convertible into boards in less than one eight hundred thousandth the time required by nature. At the present



THE PLANT OF THE MASON FIBRE COMPANY, LAUREL, MISSISSIPPI, WHERE WOOD WASTE IS EXPLODED AND CONVERTED INTO HARD BOARDS AND INSULATING MATERIAL. IN THE BACKGROUND IS THE GREAT TRASH BURNER OF THE WAUSAU SOUTHERN LUMBER COMPANY, INACTIVE SINCE THIS NEW UTILIZATION OF MILL WASTE

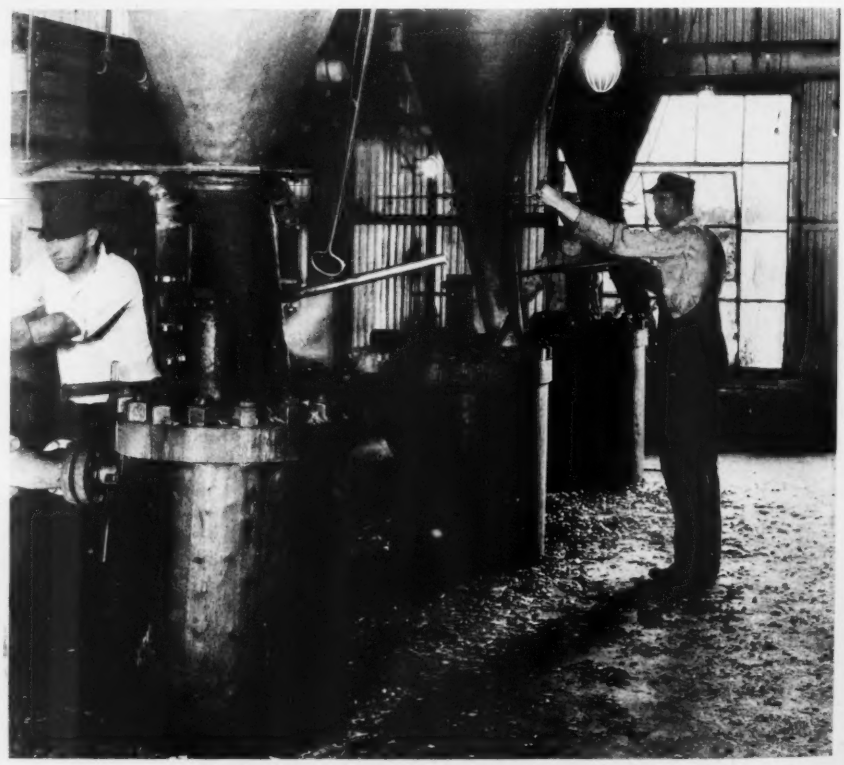
AMMUNITION FOR THE GUNS. MILL WASTE BEING TRANSMITTED TO THE HOG WHERE IT IS CUT INTO CHIPS AND SCREENED BEFORE BEING FED INTO THE GUNS

rate of production this would mean that more than four million square feet of wood products would be turned out from the plant every month. This from mill waste that about a year ago had been disposed of in giant waste burners at a great expense.

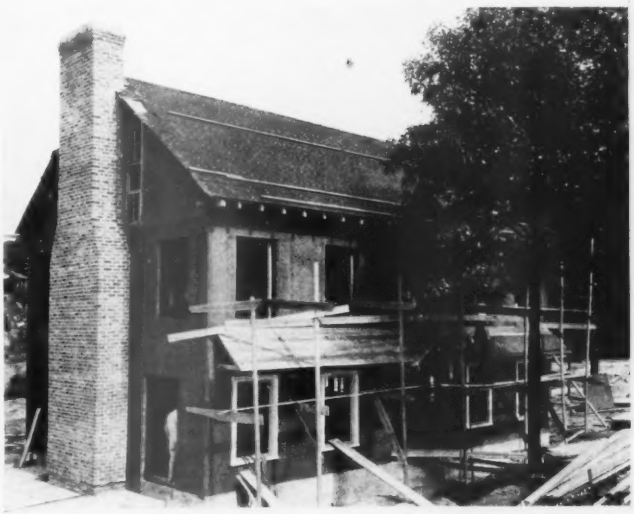
There is no miracle here, though the means are exceptional in their simplicity of execution. The explosion process is the open sesame by which wood waste is defibered by steam pressure and later converted into hard boards and insulating material. It is the invention of William H. Mason, vice-president of the Mason Fibre Company, located at Laurel, Mississippi, adjoining the plant of the Wausau Southern Lumber Company's saw mill, whose saws supply the raw material, or mill waste.

The Masonite fiber process has been heralded as an outstanding development in wood fiber making. But recently developed and put into commercial production only within the past year, its full possibilities are yet to be determined. That it will revolutionize past theories in respect to wood waste, is freely predicted. Briefly, the process, through the use of saturated steam at high temperature and pressure, explodes the wood waste and converts it into wood pulp of long fibers encrusted with the original wood lignins. The process has been given the trade name of Masonite. One of its commercial products is Presdwood, an extremely hard and durable board of great tensile strength, in which, by means of compression at a predetermined temperature, the wood lignins are made to serve as a binder to reweld the fibers in a compact mass.

A second commercial wood product developed from the Masonite process is an insulating board, which follows the usual process of manufacture up to the drying stage. Here it is handled in a hydraulic press instead of through drying rollers, and by different variations in temperature and pressure from that used for Presdwood, is given a hard compact surface on either side, with the insulating qualities preserved in the central mass.



MANNING THE GUNS. WOOD CHIPS ARE EXPLODED INTO FIBER AS THEY ARE SHOT THROUGH THE GUNS AT A VELOCITY OF 4,000 FEET A SECOND

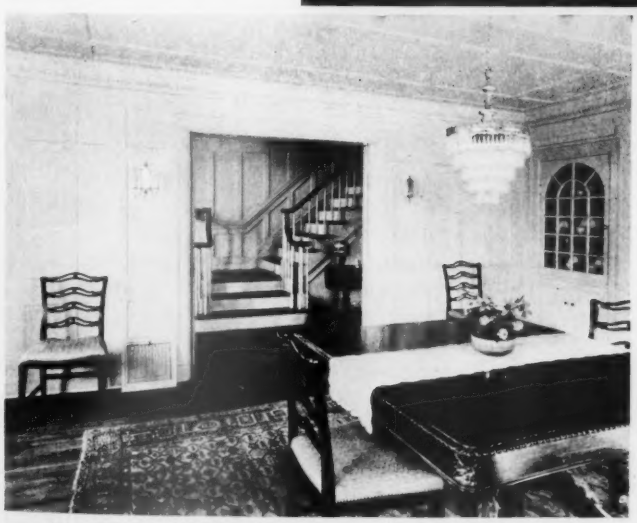


By the use of this steam exploding process the high power cost, the loss of fifty per cent of the material which results from the chemical pulp processes, and the slow laceration of fibers entailed in the mechanical grinding process, are avoided.

The last is probably the most outstanding as the rapidity with which the wood fibers are separated by the proper combination of degree and duration in temperature without noticeable deterioration of either the cellulose or lignin, is a marked advancement over the seven to thirteen hours of cooking, now necessary in most of the pulp wood processes. The steam explosion process is almost instantaneous, bringing about virtually complete separation of the wood fibers in 20 seconds.

THE RESIDENCE OF W. H. MASON, VICE PRESIDENT AND GENERAL MANAGER OF THE MASON FIBRE COMPANY, AT LAUREL, MISSISSIPPI, DEMONSTRATES THE USE OF THE EXPLODED PRODUCTS IN BUILDING CONSTRUCTION.

ABOVE: MASONITE INSULATING BOARD WAS USED TO INSULATE THE HOUSE AND THE INTERIOR FROM ATTIC TO BASEMENT WAS FINISHED WITH PRESDWOOD



DINING ROOM AND ENTRANCE HALL IN MR. MASON'S RESIDENCE IN LAUREL, FINISHED WITH PRESDWOOD, A PRODUCT OF EXPLODED WOOD WASTE

It is scarcely possible to effect overnight radical changes in time-hallowed customs of doing things. The Masonite process was not evolved in a day. Like many of the great mills in the South, the Wausau Southern Lumber Company was equipped with a giant waste burner into which the mill waste was disposed and promptly burned. The sight of this extravagance loomed black upon Mr. Mason's vision and the idea of finding an economic way of converting this waste into profit took form. His first experiment with wood pulp was discarded when it was found that the pitch in Southern pine woods impaired the efficiency of the grinding surfaces. Another thing, it was soon found that power costs were far too high to consider the mechanical grinding process. The chemical process was then tried and as quickly rejected because of the loss of the raw material in the digesters, and

because of the difficulty in handling the bark on the slabs and edgings.

From the first Mr. Mason was aware that in working with a raw material of practically no immediate value, a process of a comparatively inexpensive nature must be evolved in order to insure commercial success. Thus the possibility of utilizing any of the known processes of defibering wood was discounted.

In the spring of 1924, after many months of experimenting, Mr. Mason hit upon the idea of exploding wood. It occurred to him that wood, being plastic when subject to heat and moisture, and this plasticity probably being due to change in the lignins under those conditions, it might be possible to soften the lignins and blow the fiber apart with the same steam that had been used to soften the wood. So in an old shed adjoining the sawmill of the Wausau Southern Lumber Company at Laurel, he built his first "gun," consisting chiefly of a piece of old shafting three inches in diameter and fifteen inches long. A hole was bored in the end of the shafting and enlarged inside in cylindrical form to a dimension twice the size of the neck through which the boring was made. The outside of the muzzle was tapered to a ground valve joint and a valve inserted. The gun chamber was then filled with chips and water and the valve placed at the breech opening. Two gasoline torches were directed against the side of the gun until the temperature inside rose to 480 degrees, indicating a pressure of 600 pounds. A bar was then placed against the firing pin and a sharp blow with a hammer on the other end of the bar knocked the pin loose and allowed the valve to blow out. It was a success, although the valve was never found.

Rapid development followed and when the great plant of the Mason Fibre Company was ready for operation in June, 1926, the gun and the unique hydraulic mechanism for its instantaneous discharge developed into the center of energy around which these crusaders against wood waste are rallying.

Today there are three guns at the plant. About 200 pounds of green chips are charged into each, the valve is closed, and for from 10 to 15 seconds the chips are steamed, thus softening the lignins of the wood. The steam is then turned on to a pressure of 1,000 pounds for from 3 to 5 seconds before blowing them from the gun at a velocity of 4,000 feet per second. They are exploded into fiber as they pass the ports on their way into the wooden stock chest.

Only about one-third of the mill waste ever reaches the guns. The steady stream of slabs, edgings and sawdust that comes in from the mill first goes into a hog where it is cut into chips, and afterwards screened to substantially the same size as used in an ordinary paper mill. The remaining two-thirds goes into the furnaces as fuel. After the chips are shot from the guns and evolve a mosslike fiber, water is added in the stock chest so it can be drawn out to the refiners. These machines, designed by John A. Wiener, superintendent of the plant, are somewhat similar to a jordan in principle, except the material enters at the large end and is discharged from the small end.

The refined stock then passes to the press rolls. Here the sheet of fiber forms to a thickness of about two inches. It then passes through the rollers and is reduced to three-quarters of an inch in thickness. After this the sheet is automatically cut into twelve-foot lengths and is fed by a tipple feed to racks before it is placed in a press.

Four presses are required to handle the product. Each press contains twenty-one steam heated platens. The wet sheets are drawn in between the platens on wire cloth, and the press closed. Each press is capable of exerting a pressure of 2,000 tons. In making insulation board seven-sixteenths of an inch in thickness, the time in the press is about fifty minutes. Presdwood, one-eighth of an inch in thickness, requires but twenty-five minutes.

Each charge of the press produces approximately 1,000 square feet of board and when the press is discharged back into the empty rack, the boards are ready for the market except for cooling and trimming.

The chief Masonite product, Presdwood, possesses many unusual qualities which have won for it a wide variety of uses. Automobile doors, radio cabinets, desk tops, card tables, wallboard and paneling are just a few of its specialized uses. Bricks have been pressed from the fiber and heavy lumber has been produced. The product, according to Mr. Mason, has a tensile strength of from 4,000 to 5,000 pounds per square inch, equal to many woods with grain. Since this product has no grain, its tensile strength is equal in all directions, whereas in ordinary wood the strength across the grain is much less than with the grain. Being a wood product, the board is subject in a limited degree to moisture. However, its resistance is such that the small absorption that does take place does not affect its hardness appreciably.

In viewing the great plant at Laurel, one is immediately impressed with the air of permanency in which Mr. Mason has surrounded himself. This is evidence that the operation of the plant is not contingent upon the operation of the sawmill. While mill waste is utilized to the fullest extent, it is explained that forest waste can be utilized just as handily.

Thus, the advent of exploded wood may have a far-reaching effect upon forest utilization and the practice of forestry throughout the country. Forest waste has long been pointed to as an unnecessary loss in our forest resources and as a factor hastening their exhaustion. Further, it constitutes dangerous fire hazards, and in many regions retards new growth. Tree tops and slashings unsuited for lumber present an abundance of ammunition for the guns. Slightly decayed and deformed trees, or trees under logging dimensions can be utilized in the exploded wood process.

(*Continued on page 632*)

The Nott Elm

By John D. Guthrie

IN 1813 when Joseph-Jacques Ramee, the French landscape architect and engineer, drew up plans for the buildings and grounds for Union College, at Schenectady, New York, he included therein a garden. The plan for this garden was later carried out by Professor Isaac W. Jackson, Union, '26, and it was well under way by 1835.

The garden was a beautiful piece of land on the borders of the college grounds, covered largely with a fine old growth of elms, maples, beech, hemlock and white pine, a combination of natural woodlands and formal effects, through which ran a brook. Since the early thirties Union College men have known it as Jackson's Garden. Within this garden, almost on the brink of the college brook, was a spot of greensward and near its center still stands an elm, a tree that well deserves a place in America's hall of fame for historic trees. For many generations this tree has been known as the Nott Elm, so named in honor of Dr. Eliphalet Nott, the famous educator and maker of men, and president of Union College from 1804 to 1866.

The White Studio

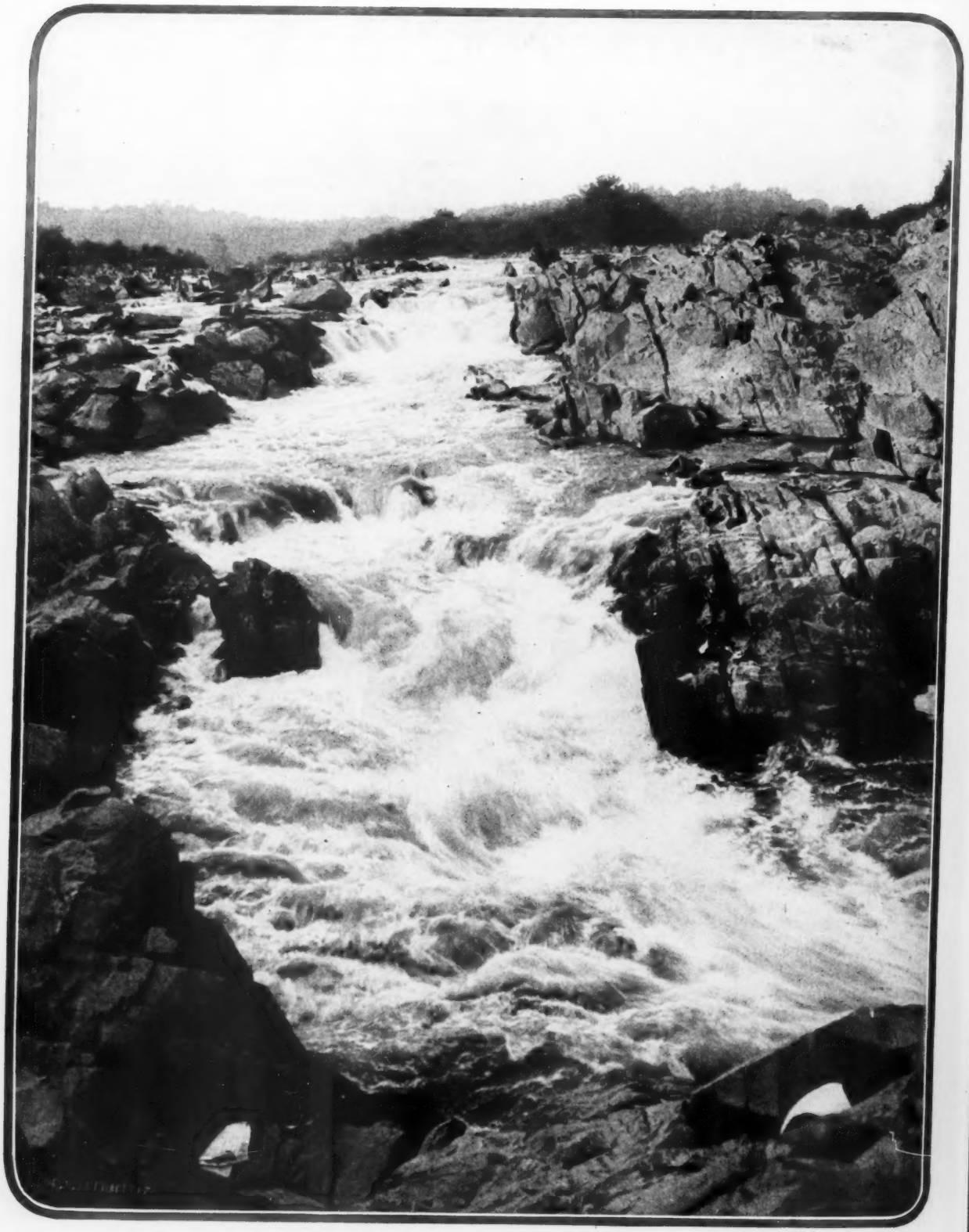
THE NOTT ELM

Beautifully located in the grounds of historic old Union College at Schenectady, this tree was in all probability a lusty sapling when Columbus first touched America's shores.

This old tree, estimated to be not less than 500 years old, has been a mute witness to much history making. It was probably a lusty sapling when Columbus landed on America's shores; certainly it was more than a sapling when Jamestown was a struggling settlement, and when the Pilgrims were fighting the Indians and the New England winters.

Jackson's Garden was ever a favored place among students in quest of a quiet walk, or for rest and repose with untrammeled nature. It came to occupy a distinct place in the life of the college. Even before Civil War days, the Nott Elm sheltered the last informal meeting of the senior class, and the custom is still retained. Here on a late afternoon of commencement week gather the black robed seniors and, seated around the base of the Elm, listen to the pipe oration, the class prophet, and sing their class song. No fewer than seventy graduating classes have sat beneath this old tree. Many men later to become illustrious in American history have sat with their classes beneath the old tree's kindly shade,—statesmen, preachers, ambassadors, judges, jurists. W. H. Seward must have known this old tree, as well as James A. Bayard in Union College at the same time; and Robert Toombs, later Secretary of State of the Confederacy. John Bigelow and Chester A. Arthur, too, must have come here time and again. Secretary of War Daniel S. Lamont and Governors Nathaniel P. Talmadge, John T. Hoffman, Ridgeley C. Powers, Platt Carpenter, John Gary Evans and James M. Carey; Senators Preston King, Warner Miller, Frank B. Gary and Frank X. Ransdell; scientists like Seaman A. Knapp, agriculturist; Franklin B. Hough, the father of American forestry; William de C. Ravenal, naturalist; George Westinghouse, Jr., the inventor; Sheldon Jackson, the man who introduced reindeer into Alaska.

And so this grand old tree, the Nott Elm, is nominated for a place among the sylvan immortals, because it has helped to make history in the beautiful old Mohawk Valley.



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THE GREAT FALLS OF THE POTOMAC

The proposal to harness this rare and inspiring cataract by the construction of reservoirs that would mar the natural beauty of the Potomac River for forty miles above the Nation's Capital, has brought forth a storm of public protests.

Power or Parks on the Potomac?

By Harlean James

WITH the increasing number of conflicting demands upon the land and water resources of the United States we are faced with the necessity of weighing carefully, from the standpoint of the public welfare, the various claims put forth. Decisions, manifestly, should be based on the principle of "highest use," that is, the use yielding the highest degree of benefits for the people as a whole. It is apparent that not all of the land physically suitable for forests, for agriculture, for grazing or for parks, or all of the streams physically adapted to the development of power or irrigation reservoirs should be devoted to these purposes, if the best interests of society are to be consulted. It is not economical to plant every acre of arable land in the United States. Every gorge and waterfall in the country need not be utilized for power.

The people of the United States are brought fairly to a realization of these problems by the application of the Potomac River Corporation to the Federal Power Commission for the issuance of a preliminary permit to develop power along the Potomac River. The proposed project calls for the flooding of a large region of outstanding natural beauty lying immediately adjacent to the District of Columbia. The preservation of the region, including the Great Falls of the Potomac, has long been urged as a part of the park system of the Nation's Capital. It was recommended in 1901 by the MacMillan Commission, which outlined the plan of parks and parkways still largely followed in the development of the District of Columbia, and the National

THE PALISADES OF THE POTOMAC

A view showing the Potomac River with its rugged and forested shores, three miles below Great Falls and only twelve miles from the White House. Approval of the water-power application, now pending before the Federal Power Commission, would mean the construction of a huge reservoir flooding this whole region of exquisite grandeur, which the National Capital Park and Planning Commission is seeking to preserve as a part of Washington's park system.

Capital Park and Planning Commission recently included it as a major project of Washington's park system. The issue has therefore been squarely raised as to whether the highest use of this region will be best served from the standpoint of the public by preservation as a park, or by conversion into huge reservoirs for the generation of electric power. In consequence of the provision in the Federal Water Power Act of 1920 the newly-created Federal Power Commission was authorized and directed to investigate the Potomac River power possibilities. The Tyler report was the result and, following the recommendations of Major Tyler the Norris bill to authorize the Federal Government to undertake a project on the Potomac has been pending in Congress, but though the Senate voted for the measure it has never passed the House. In view of the plans for giant power which would hook up the developed power in the United States into an interchangeable, flexible system and in view of the attitude of Public Utilities Commissions to insist that there be no avoidable duplications in distributing systems, the proposal that the Federal Government undertake this single unit of power development did not appear to have much chance of being realized. There would be ample justification for the Federal Government to develop power to be consumed by Federal agencies or for the water supply of the District of Columbia. Something might be said in favor of the development of power by the Federal Government for the exclusive use of the District of Columbia if the project included the acquirement of the privately-owned distributing system in the District. But, facing the situation as it is, the general public, apparently, did not believe that there was any real danger to the Potomac from former proposals. Now that there is a definite application from a company known to be well financed, public opinion is becoming articulate. It should be explained that under the Federal Water Power Act of 1920 the Federal Power Commission may grant licenses only after securing the approval of the Chief of Engineers and the Secretary of War. It is customary, therefore, that hearings be held on the applications for preliminary permits by the Engineer's office. Hearings were held on August 24 at Harpers Ferry and on August 25 in Washington before Major Brehon Somervell, District Engineer. It was brought out at the hearings that the Potomac River Corporation at the present time had in mind following very closely the Tyler Report, though it proposed an additional reservoir at Harpers Ferry. The tentative proposals include power dams at Chain Bridge, Great Falls and Harpers Ferry, and storage dams near Charlestown, Romney and Berkeley Springs, West Virginia, and Broadway, Virginia. Under the Act the issuance of a preliminary permit would enable the Potomac River Corporation to expend funds for detailed surveys, with the assurance that it would have priority over every other application except that of the United States Government. The corporation claims to have expended $110,000 already. It would not be surprising if the cost of its preliminary surveys ran well

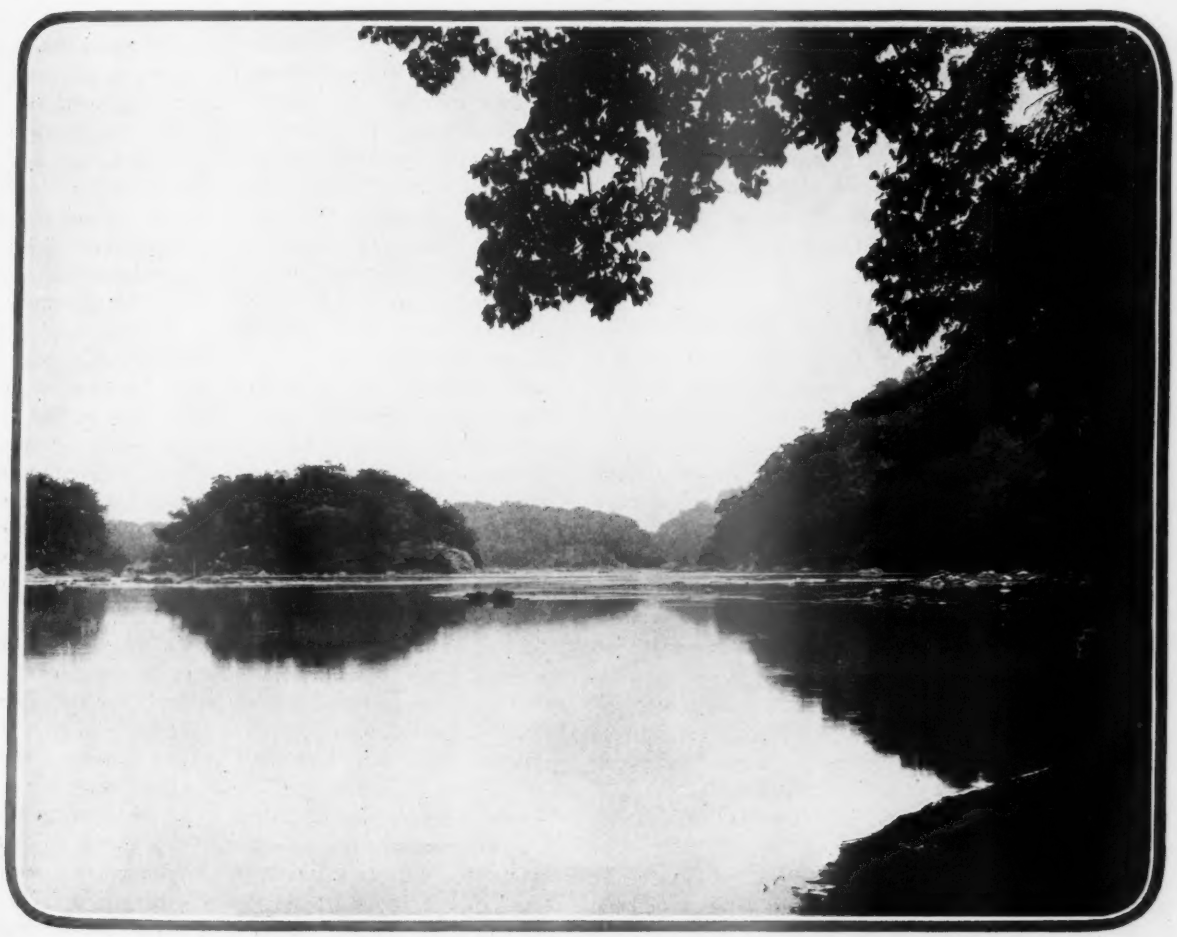
DIFFICULT RUN, WHERE IT TUMBLES OVER THE ROCKS TO JOIN THE POTOMAC, TYPIFIES THE WILD AND SEQUESTERED BEAUTY THAT LURKS THROUGHOUT THE REGION

over half a million dollars. The volume of new power sought to be developed would exceed that now being used in the District of Columbia. The estimated investment would total $60,000,000.

The questions which ought to be answered are these:

1. *Is there a public necessity for the power proposed to be developed on the Potomac?* The representatives of the Potomac River Corporation stated at the hearing that it was not their present purpose to retail the power developed, but that they would seek to sell it to the best advantage to existing distributing companies in Washingon, Baltimore, Richmond or elsewhere. It was apparent to impartial observers of the hearings that the proposal to develop power was not in answer to any great expressed present need, but was, on the contrary, a project to invest money in a development of power for which it was thought sufficient market could be worked up to make a return on the $60,000,000 investment. A representative of the Potomac Electric Power Company, which now serves Washington with power, declared that there is no public necessity for developing power at this time, as the Potomac Electric Power Company stands ready at any time to furnish any additional power for which there is a demand in Washington, and indicated that generation of power by steam might prove more economical than power furnished by the Potomac River.

2. *Is there any assurance that the consuming public and the Federal departments in Washington would secure any advantages or lower rates?* There is no promise and little prospect that the power developed on the Potomac will bring cheaper power for domestic use to the residents of the District of Columbia or, indeed, to the residents of any other locality. If the power developed is hooked up with the giant system, rates will be determined by public utilities commissions and may not have reference to the cost of this single unit. It is feared that in an effort to create a market for the power developed the tendency will be to induce industries to come to Washington, and this, in the opinion of those who desire to see the Federal City protected from the complications of unrelated industry or commerce in order that it may become the most efficient



THE QUIET BEAUTY OF THE POTOMAC

Two miles below Great Falls on a lazy summer's afternoon. Photograph taken from foot of Black Pond Road. The proposed reservoir would raise the water to within five feet of the top of the island shown in the left of the picture.

seat of national government in the world, would be contrary to the best interests of the Federal Government.

A representative of the Potomac River Corporation stated at the hearings that, in his opinion, industries would not be drawn to Washington, but that Baltimore, which is now an industrial city, would continue to demand increased power. If this is true, the natural park which should be planned in the environs of the Federal City, would be sacrificed to provide power for an industrial city forty miles away, without the slightest assurance at this time that the power would be sold to industries or distributors in Baltimore at a less rate than it could be developed by steam. There seems to be no sure advantage in sight to the Federal departments, and it is conceivable that the storing of large volumes of water so near Washington might through accident or sabotage bring great damage to the memorials and buildings located on the banks of the river.

3. *What would be the damage to established farms, homes and possessions economically and socially?* At the Harpers Ferry hearing the representatives of Brocks Gap protested earnestly against the reservoir planned for this section. They claimed that at least 30,000 people would be affected adversely, directly or indirectly. Many homes and farms would be inundated. Others would be cut off from convenient access with the outside world. This section was settled in the early days of Virginia, and the residents have a peculiar affection for the homes of their ancestors, so that, in addition to the very substantial economic damages, they declare that the destruction of their homes, churches and cemeteries could not bring compensation in money.

4. *What would be the damage to natural scenery of a character to deserve preservation in its natural state?* The greatest opposition to the proposed power project comes from the District of Columbia and from the people of the United States who desire to protect the Federal City and its environs from unnecessary commercial exploitation. Colonel Grant, executive officer of the National Capital Park and Planning Commission, at the invitation of the Federal Power Commission and in accordance with resolutions passed by the Planning Commission on July 18, filed a brief protesting against the issuance of a preliminary permit to the Potomac River Corporation, based on the grounds that the Planning Commission had adopted as a major project for the regional plan of the District of Columbia and its environs the creation of a park under interstate or Federal control, to preserve and make accessible the gorge and Great Falls of the Potomac in a natural state.

In his brief, Colonel Grant called attention to the many writers, foreign and American, who have been impressed with the beauty of the Great Falls and the Gorge of the Potomac. Lord Bryce, familiar with the great cities of the world, maintained that "no European city has so noble a cataract in its vicinity as the Great Falls of the Potomac, a magnificent piece of scenery, which you will, of course, always preserve." Chief Justice Taft, writing in 1915, thought that "Washington picked a site for the thousands of years which we hope will be the measure of our national destiny," and he declared that "the capital of no other nation approaches it in the beauty of its situation."

According to the present plans, a power station would be dug into the palisades near Chain Bridge, and the water would be raised to cover the lower parts of these impressive cliffs and would back up into Cabin John Creek to a height reaching the arches of the famous Cabin John Bridge, wiping out the wooded banks and islands of the river between Chain Bridge and Great Falls. The dam above Great Falls would rise 60 feet. With the present picturesque foreground submerged and a 60-foot wall in the background, the Great Falls of the Potomac would indeed be *modified*.

Representatives of the Potomac River Corporation claim that the substitution of a beautiful lake in the Gorge of the Potomac to cover the bare, dank rocks which are exposed and the building of a pleasure drive around the shores of the lake will, in their opinion, improve the scenery and offer recreational opportunities to the people of Washington. The beautification of reservoirs, whether for water supplies or for power and their collateral use for recreation is recognized as a cardinal principle in developing open spaces around cities, but it is equally recognized that areas set aside for parks should not be used for other than park purposes. The constant repetition of fluctuation in levels of reservoirs used for power purposes offers special difficulties in preserving a picturesque shoreline.

The opportunities to create magnificent natural parks are all too few. Washington should not neglect this unparalleled opportunity. Rock Creek Park is famous among American parks, not because of the artificial improvements but because in making it accessible, the natural features have been preserved. It would be nothing short of a crime to permit the introduction of power plants and the building of reservoirs which would destroy the beauty of the Gorge dependent for its effect on the lofty palisades, which would submerge the wooded islands and surround the Great Falls with commercial structures.

Let us examine into the precedents which show the trend of public opinion on the part of the American people. When the Federal Power Act, having passed both houses of Congress, came to President Wilson for signature, the then Secretary of the Interior, John Barton Payne, asked the President to veto the bill because it would permit power to be developed in the National Parks. The sponsors for the bill and the leaders in Congress entered into a "gentlemen's agreement" that if Judge Payne would withdraw his objection and the President would sign the bill, they would in the next Congress exert their influence to pass an amendment exempting the National Parks from the

(*Continued on page* 640)

Tree Cavities

Prompt Attention To Small Injuries Will Prevent Most Tree Surgery

By H. Gleason Mattoon

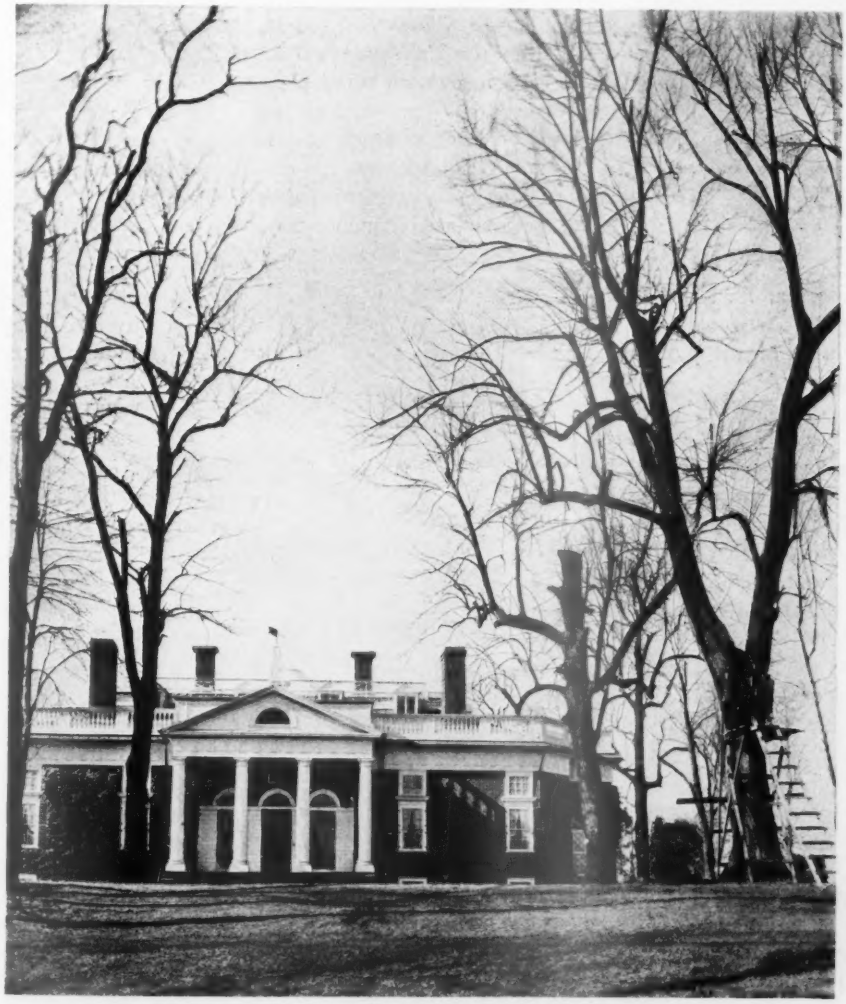
OF all the phases of tree care, cavity work, as it is called by tree experts, is least understood. Let us put down a simple definition of cavity work. It is the excision or cleaning out from the living tree of all wood which has been attacked by disease.

That sounds very simple. Unfortunately, its apparent simplicity has led to many grave errors of execution. In the first place, all diseased wood means just that: every bit of infected wood must be removed. That is the first difficulty. The point at which diseased wood stops and healthy wood begins is often not easy to determine. Having done this, however, the next step is a thorough disinfection with creosote, carbolineum or other similar substance, of the remaining wood. Naturally, care must be used that the disinfectant does not come in contact with the growing part of the tree, i. e., the cambium and inner bark. Next, the lining of the cavity must be waterproofed to prevent the re-infection of the tree at that point. Various asphalt preparations suitable for that purpose are on the market.

Having done all of this, the next questions to be decided —although, naturally, they should have been decided before the work was started—are, first, shall the cavity be filled or left open? Second, if filled, with what material?

Theoretically, the open wound, properly disinfected and waterproofed and frequently inspected, is best in old trees. Practically, except in certain cases, it is a debatable procedure. Many tree owners dislike the appearance of a black hole in a tree, particularly if it is criss-crossed with tie rods and braces. In addition, most people have the idea that "now that I have had the tree doctors go over my trees, I won't have to bother with them again," so they do not have these open wounds inspected. No words can express too emphatically the fallacy of that viewpoint. It is a mistaken idea, which has increased the cost of tree care greatly.

We go to a dentist regularly to keep our teeth in good condition. If there were a nerve running from the tree to the owner which would register pain as soon as the tree became infected, there would be less pain in the pocketbook. In other words, if once your trees are put in good condition and you have them inspected regularly, the cost over a period of years would be almost negligible. To sum up the matter of the open cavity, if the owner does not object to the appearance and



SAVING THE JEFFERSON TREES

Beautiful old trees, planted by Thomas Jefferson, guard the mansion at Monticello. They were in bad shape, but a fine piece of tree surgery has undoubtedly extended their lives for many years.

A NEW TYPE OF FILLING

A wood filling in a maple, completed except for the face. In this case an experiment with a new preparation known as plastic wood is being carried on.

successful than others. Many arboriculturists, however, look upon concrete with disfavor. Some, however, believe that it may be used satisfactorily in small wounds on the trunk of young, fast-growing trees.

Since the first employment of concrete many other materials have been tried. A composition of magnesite, sawdust and magnesium chlorid has been used with a fair degree of success. This material expands and contacts more nearly in the manner wood does, but in contact with the ground it is very apt to deteriorate. It adds practically nothing in strength to the trunk or limb in which it is placed, and there is the danger that the chlorid will come into contact with the cambium and kill it.

There are several other preparations and combinations of materials each of which has its champions, but with all, the disadvantages are so great that they are seldom used commercially.

A FINISHED JOB

A completed wood filling in the basal cavity of an old beech. After a few days the tree compound used on the face loses its lustre.

will have it inspected at least three times a year by a person competent to do it, that solution of the problem is sometimes best.

Any discussion of cavity fillings should be prefaced with a consideration of the reasons for filling a wound. Fillings were adopted on the assumption that the wound would thus be made immune to further attacks of fungi or re-infestation with borers and, in addition, the tree would be strengthened by the material adopted to fill the hole.

The first of the materials used in large quantities with these two purposes in view was a rich mixture of Portland cement and sand. By most authorities this substance is not now considered to add to the strength of the tree. With regard to concrete making the wound sporeproof and waterproof, the difference in the coefficient of expansion between wood and this material makes that aim doubtful of attainment.

Various methods of applying concrete have been adopted, some more

THE OPEN TYPE OF TREATMENT

An open wound is doubtless preferable in such a tree as this old Kentucky Coffee. The cambium grows very slowly in this species.

One hundred and twenty-five years ago, when tree repair work was in its swaddling clothes, wood plugs or caps were used very largely. In considering a filling for trees it would be natural to assume that sound wood to replace the removed diseased wood was the answer to the problem. Only one difficulty lay in the way, and that was the lack of a mechanical skill necessary to apply it properly. The technique required to shape the wood to the contour of the wound has been developed, which makes this, without doubt, a very satisfactory filling for many cavities.

Wood is comparatively cheap. It can be attached to the walls of the cavity. It expands and contracts with the tree. It adds strength to the tree and will maintain a waterproof face longer than other fillings. While the time required to apply the filling is slightly greater than for other fillings, the cheapness of the material reduces the total cost below that for other fillings. Wood blocks have long been recommended by prom-

(*Continued on page 637*)

Boys and Girls in Forestry

By K. E. Barraclough

"Likewise in dealing with the younger generation we must localize forestry and give it some opportunity for concrete expression. Millions of boys and girls are enrolled in scout troops and campfire clubs, extension clubs and summer camps. They take to the woods for health and pleasure and because they are not yet over-civilized. Here is a rich opportunity to give them respect for the forest by *doing* for it. Forestry agencies should seize the opportunity to give these boys and girls something more than the stereotyped bookish facts of forestry by setting them at specific tasks and problems in the woods. It is possible that so far as juvenile education is concerned, the main opportunity for genuine forestry education lies in these camps rather than in our regular schools, where the tradition of second-hand fact-grubbing from books still holds the stage."

—Ward Shepard.

FORESTRY is among the most important of all the studies that need to be included in the education of our young people, because the future of the country depends upon a sufficient supply of wood. The Director of Food Research Institute, Stanford University, says, in a discussion on population problems, "Pressure on the future domestically grown food supply will not come from the 160 to 170 million animal units and the 175 million human beings, but from industrial demands for wood, paper, and fibres. Substitutes for lumber, paper, and fibres are being rapidly developed, but the demand seems to advance at least as fast as the supply. When to the future problems of lumber, paper, and fibres, we add those of fuel and the metals, direct difficulties with the food supply would appear to be so simple as to be relatively negligible."

Teaching the principles of forestry to boys and girls has never in the past been carried out in an organized manner. We need to offer boys subject matter in forestry and show them how to put such subject matter into practice, because most boys are interested in the forests. We can all recall, as boys, the numerous excursions to the neighboring woodlot, where we usually demolished rotten stumps in our at-

BEFORE—LEON MEADER, OF ROCHESTER, NEW HAMPSHIRE, LOOKS OVER THE SITUATION BEFORE STARTING WORK ON HIS FARM WOODLOT.

AFTER—A GOOD JOB WELL DONE. THE BOY HAS COMPLETED THINNING AND PRUNING ON HIS WOODLOT.

tacks upon imaginary enemies. Without a doubt if these efforts had been properly directed, our trips to the woodlot could have been of a constructive nature without lessening the element of play. It is fair to believe that boys are as far sighted and are as ready to direct their efforts in productive labor as an adult. In fact they are more enthusiastic than adults and do not hesitate because an undertaking does not promise immediate gains. Naturally a boy will not work at forestry ten hours a day. Boys are not built that way. The underlying principle in teaching forestry to youth is that they have been started in the right direction, and whether the boy becomes a bank president or farmer, he will maintain the proper attitude toward forestry. Would those who oppose forestry legislation to-day do so, if they had worked as young foresters in the woodlots and had come to appreciate the importance and value of trees?

Forestry for boys has been given serious consideration by many organizations. The 4-H organization sponsored by the United States Department of Agriculture has in many of the states accepted forestry as a standard project. The New Hampshire 4-H organization adopted forestry as a standard project in 1924, and from that time the enrollment in 4-H Forestry has steadily increased. For the 4-H project year, October, 1926, to October, 1927, over five hundred boys and girls enrolled in 4-H Forestry work. As a result of this enrollment 266 acres were improved, over 40 wood collections made, and 166,000 pine trees planted on 142 different lots. 4-H forestry projects include woodlot improvement, tree and wood identification, planting, seed collection and nursery practice, and woodlot management.

4-H FORESTRY GIRLS PLANT YOUNG PINES
These two sisters, Lillian and Norma Nichols, of North Charleston, New Hampshire, are enthusiastic young tree planters.

4-H Forestry work in New Hampshire obtained its start through the excellent cooperation of the Society for the Protection of New Hampshire Forests. The Society for the last three years has made available, in the different counties, prizes to winners of different forestry contests. The success of 4-H Forestry work is indicated by the boys themselves.

Roy Newton started 4-H Forestry work by planting 500 pine in the spring of 1925. In the fall he improved an acre of pine land. His work showed up so well that a lumberman of the district hired Roy, placed him in charge of two workmen and instructed him to improve some of his woodland. The boy with the two men in a short time improved six acres of woodland.

The following are extracts from letters sent by a forestry leader of a community to a county club agent, and indicate the enthusiastic interest of the boys.

"Last night, so far as I knew, there were ten boys who were ready to go this morning. By eight-thirty they began to appear, and every time I looked out I saw a new boy with an ax on his shoulder. Big boys, little boys, boys with axes sharp, boys with hatchets sharp, boys with the same implements dull. Before I started I lectured to them on the necessity of being careful not to swing the ax or hatchet before they were sure they were clear of brush, trees, or other boys, not to cut any tree until they were sure it was useless, since it takes considerable time for a small tree to grow."

A few weeks later he wrote the Club Agent:

"All told, we have had four days at the pine, and the attendance has been as follows: 28, 32, 25, and 17. About five acres have been all cleaned, the brush mostly burned, some thinning and some selective pruning done. On Saturday, December 11, twenty-four of the boys went out with me and cut grey birch for fuelwood, which is to be sold, and after deducting expenses the balance is to be turned into the forestry club treasury."

One boy planted 2000 pine trees last spring.

Two boys on an eighty acre farm are improving the sixty acres of woodland.

One forestry club has released over five acres of young growing white pine by cutting over-topping grey birch.

A father in Massachusetts has bought a so-called abandoned farm in New Hampshire for his son. The son is to start a crop of desirable forest trees on the farm.

Such specific examples indicate the spirit and interest boys put into 4-H Forestry work. Boy Scout organizations, Pioneers, and numerous other boys' organizations have taken forestry into their active program of work. They learn the names and uses of forest trees, the necessity of protecting the forests from fire, insect, and fungus diseases. Many of the groups in these organizations are practicing forestry. They often take an active part in developing the town forest, assist in tree planting, and are especially active in helping fight forest fires. A forest fire that burnt over fifteen hundred acres of forest land not long ago was held in check largely by the assistance of boys under sixteen years of age. It has often been found that boys, if properly handled, are apt to develop into the best workmen in the eradication of currant and gooseberry bushes in the control of the White Pine Blister Rust Disease. In summer camps forestry has become a live subject. Boys are taught the elements of forestry and at many camps are given the opportunity to practice forestry. In fact forestry has become such a live issue at these summer camps that the camp directors of New Hampshire in cooperation with the Society for the Protection of New Hampshire Forests hired a forester this past summer to go from camp to camp, and instruct the boys and girls in the elements of forestry. At present there is an attempt being made to inject into such studies as geography and nature study in the graded schools the forester's point of view. Many states conduct school essay contests in forestry.

A FAMILY AFFAIR

The Batchelder boys,—Walker, James and Watson—of Pembroke, New Hampshire, busily improving the home farm woodlot and striving to win forestry honors.

ANOTHER NEW HAMPSHIRE WINNER

This is Melvin Hodgson, of Dover, surveying his finished woodlot improvement. At the present time 500 boys are carrying on some kind of definite forestry work in the State.

It would not be right to leave the impression that only boys are interested in forestry. Girls apparently are very much interested in the subject, and come in for lots of credit for what they are doing. In fact, last year in New Hampshire there were two girls, enrolled as 4-H Forestry members, who planted 500 pine trees. The Camp Fire girls organizations are active in the field of forestry, and this organization has dedicated the year 1927 as tree year in Camp Fire, with a definite forestry program for the year. Actual tree planting will be done by different Camp Fire groups. The organization will spread the idea of forestry by celebrating Forest Week, and Bird Day; by arranging a tree exhibit, giving a pageant on forestry and lectures on the subject. Nature activities will be directed in such a way as to bring out their relationship to forestry, and conservation of forests will be given an important place on the program. Such subjects as fire protection, insect control, protection of wild life, and the intelligent use and care of forests and parks will be stressed during the year. At girls' summer camps forestry in many cases is actually practiced, and at several such camps in the White Mountains last summer, trees were planted by the girls themselves.

The movement to give boys and girls an opportunity to do practical work in forestry has hardly started. During the short time that it has been under way results indicate that this is a field well worthy of cultivation and rating the interest and cooperation of the professional forester.

THIS IS A SECTION OF CLIFF PALACE, THE DWELLING PLACE OF SOME OF AMERICA'S MOST ANCIENT CORN GROWERS

Undoubtedly a peaceful, farmer folk living quietly and cultivating their fields of corn, such structures as this were their strongholds against their Indian enemies.

The Prehistoric Corn Belt

"Who's Who in American Grasses"

By Will C. Barnes

WHEN a boy on the farm I was told that Kentucky Blue Grass came from Kentucky and Bermuda Grass from Bermuda. Lucerne (alfalfa) they told me came from the canton of that name in Switzerland and Irish potatoes came, of course, from Ireland. Just where the Blue came into Blue Grass my informant could not say. When I pressed for an answer to my question he only made the puzzle still deeper to my boyish mind by asking me to explain how a "Red cow could eat green grass, and give white milk that made yellow butter."

Later in life—and not so many years ago at that—I learned there were between 8,000 and 9,000 different species of grasses in the world, of which not over 50 or 60 are cultivated, and what surprised and I think humiliated me most was that nearly all the common grasses an American farmer boy knows are not natives of America as I had fondly imagined, but have been introduced into this country from Europe.

I learned also that the long limber bamboo fish pole I used to carry into the woods on Saturdays was but a giant grass. Of course in the West we have some very useful native grasses, such as the Gramas and Buffalo grasses of the Southwest, the Prairie June Grass and Wheat grasses of the Great Plains region, Kansas, Nebraska, Dakota and those prairie states, but practically every one of our common cultivated pasture grasses and legumes, on which American agriculture leans so heavily, has been imported from some European country. This long list includes Kentucky Blue Grass, Bermuda, Red Top, Timothy, Orchard Grass, all the Clovers, including Sweet Clover (*Melilotus*), the Carpet grass of the South and all the Sorghums, Kafirs, Millets and that type of plants which botanists say are simply tall grasses. Why, those chaps will tell you that wheat is but a grass. How were these various plants so widely scattered over this country? Take Sweet Clover for instance. We got that from far off Asia presumably landing first on our Atlantic shores. Today you run across it everywhere in the wildest part of our

western country, often many miles from farm areas, from which it might have escaped. White Clover is another wanderer. Forty years ago I ran across a lovely bed of pure white clover in one of the remotest parts of the mountains of Northern Arizona. There wasn't a foot of railroad in that state then, and except for the isolated military post from which we came there wasn't a civilized habitation within more than a hundred miles. Probably not over half a dozen white men had ever before been into this mountain valley.

But there it was growing, a great solid bed of White Clover. The major commanding the party, who besides being a West Pointer was also a competent botanist, believed it got there most likely through the droppings of horses ridden by a military party, the seeds of the clover having been mixed with the grain the cavalry horses had eaten.

Sweet Clover also came to us from Asia and that is also found everywhere here in a wild state planted doubtless in much the same manner.

It did comfort me, however, to learn that three or four of our important farm crops in this country were honest-to-goodness American plants. These are Indian corn (Maize), White Potatoes, Tobacco and Lima Beans. Nobody can rob us of these. They are American plants, each of which contributes so much to the needs of civilized man. Of course, we read about corn in the Bible and even in European literature, but they mean wheat, which was generally called corn all over Europe.

The odd thing about corn is that so far nobody has as yet discovered that plant in its wild state. Naturally, it must have existed once in a wild form from which our present day corn fields have descended, but no trace can be found of it in that condition. Botanists have searched the North American continent so far in vain for a wild corn or anything very closely related to it, but without success.

Wheat, rye, cotton and all other plants can be found in their wild state in the regions from which they originally came, but Indian Corn, like Topsy, never seems to have had any father or mother but "just growed."

There are scientists who believe that corn has been cultivated in this country for many ages, perhaps farther back even than wheat can be traced. Certain it is that corn cobs are found in the old prehistoric ruins of our Southwest that show those people had been growing a very good article. Those ancient peoples were undoubtedly an agricultural race as is evidenced by their many irrigating ditches which can today be traced for miles across lands now almost wholly unfit for any agricultural use. It must have taken a lot of food to

E. S. Shipp

A RESTORED RUIN IN THE BANDELIER

Here are found some of the most picturesque and interesting of these ancient structures. There is much evidence that these earliest Americans were an agricultural people, and the corn cobs and numberless corn-grinding stones found in almost every ruin point to corn as their staple food.

supply the inhabitants of these large communal dwellings which are found in the deep cañons and on top of the broad mesas of the Southwest, and while evidences exist of their using certain wild animals for food, the numberless corn grinding stones found in every ruin point to corn as their staple food.

Some of the most picturesque and interesting of these ancient ruined cities are found in the Mesa Verde National Park, near the town of Mancos in Southwestern Colorado.

A PREHISTORIC CORN-MEAL GRINDER

The large stone is the "metate." The one in the man's hand the "mano" or handstone. This was rubbed up and down the metate with the grains of corn between. The mano stones were of varying grades of roughness so the meal became finer and finer under different stones.

Here in one of the roughest, most inaccessible parts of the country, are some of the most wonderful ancient habitations known to civilization. A dozen or more of them have been located and made accessible to the public but hidden away in adjoining cañyons not yet thoroughly explored are hundreds more just as large and well built probably as those already opened to a curious world. Judging by these ruins, there must have been a large population in this region.

These people were undoubtedly a peaceful, timid, farmer folk. They lived out on the broad mesas probably in the midst of their fields of corn for much of the time, but harrassed by other Indians they apparently built these cities in the great natural shelves or caves carved from the sandstone cliffs by wind and weather. Some of these caverns are hundreds of feet above the cañon floor, all are extremely difficult of access while many have not yet been explored owing to the difficulty of reaching them even with ropes and ladders.

To these every drop of water, every stick of fuel and bit of food must have been carried at a tremendous labor cost. To them they undoubtedly retreated when hard pressed by their enemies, taking along sufficient food supply to last a long time. Probably they kept plenty of corn stored there in anticipation of such troubles.

One of the largest of these Mesa Verde ruins we visited last summer is known as the Cliff Palace. The great cave in which it is built is a beautiful proscenium arch, shaped like the half of a huge circle, at least 100 feet high in the center and the sloping roof runs back perhaps 60 or 70 feet. Its total length is over 300 feet and it lies several hundred feet above the bottom of the cañon. Even with long ladders and blasted out steps in the solid rock it is by no means an easy place to reach today. What must it have been to the ancients. "Imagine," said the kid boy of our party, "imagine mother saying, 'Son, run down to the creek and bring a bucket of water or an armful of wood.'"

The view of this Cliff Palace from across the deep cañon probably 1500 feet wide and 600 or more deep is wonderfully impressive while a closer inspection inspires one with tremendous respect for these early farmers and corn growers of our country.

The ancient cliff dweller also raised cotton, for cotton weavings are occasionally found, while corn cobs are discovered in the storerooms, in the debris at the foot of the cliff and in the rubbish of many of the rooms. There are over 300 separate rooms in this cave. Many of these buildings are three and four stories high and every stone wall is laid up as evenly and with as square corners as the masonry could be laid up today.

We dubbed the tall round tower-like structures shown in the pictures "prehistoric silos" and they certainly looked the part. Here under the vast overhang of the cliff these buildings safe from rain or moisture of any kind are in an almost perfect state of preservation. The plaster in some is as fresh as if done but yesterday. You can even see the fingerprints of the squaws who spread the soft mud. On many the huge rafters formed of tree trunks are still in place as sound and free from decay as if placed there recently.

Corn was and still is their one great food product. Further, this plant commands a leading place in the numerous ceremonial affairs and semi-religious observances the Pueblo Indians constantly enjoy.

Almost every ceremony includes sprinkling corn meal on something or somebody. The new-born babe is sprin-

kled with the finest of corn meal. When a month old its little body is rubbed all over and very gently with a ripe ear of corn. Before a Hopi snake dancer will pick up a snake from the ground he dashes into its face a pinch of corn meal taken from a little pouch in his belt.

In every living room is found the usual set of corn grinding mills. These consist of small boxes about 16 inches by 20 inches formed by setting on edge four slabs of granite or sandstone. In this box was placed the rough "meal stone" lying in a slanting position at an angle of about 45 degrees. These boxes are generally in batteries of three or four, each meal stone being of a finer texture than the other. Thus the meal was gradually rubbed finer and finer by hand or "mano" stones, the squaws kneeling in front of each box and grinding the grain by a motion similar to an old-fashioned "wash board," the meal being passed from one box to the next until of the proper fineness. This process by the way can be seen any day in the nearby Pueblo Indian villages where the descendants of these old time farmers still live in primitive fashion. On the mesa above where they lived in times of peace probably in the midst of their corn fields the government men have uncovered a great habitation or temple which, when I first visited it ten years ago, was a large shapeless mound of earth on which many cedar and piñon trees were growing. The clearing away was carefully done and the great place stands there today a wonderful piece of stone laying. The walls are 10 to 15 feet high, the roofs all caved in of course. They preserved the stump of one of the larger trees growing on the mound which was over 360 years old. Consider the ages that must have followed the abandonment of this place to admit of its complete covering by earth and the period of tree growth that followed! It is not difficult to believe that these early American corn growers were living here when the pyramids were building—perhaps long before.

"BALCONY HOUSE"
A prehistoric structure, with a sheer drop of 600 feet to the bottom of the canon.

Whence came the corn they raised? Did they breed it up from some unknown plant or did they get their seed from our Atlantic Coast Indians? Who shall say? If we follow the theory that our Indians came from the Northwest then corn was carried from the west coast to the east. The utterly incomprehensible thing about it all is that we find no traces left of the wild plant from which it must have been evolved. All of which makes scientists believe that the age of corn on this continent goes back far, far beyond any civilization that existed on other parts of the world, so far indeed that its wild form has been completely lost to the plant world.

Lost in a Forest Wilderness

A government explorer, deprived of practically all of the defensive equipment of his civilization, was lost for thirty-seven days in a storm-swept forest wilderness. In the November issue of *American Forests and Forest Life*, Edwin L. Sabin, in "*Man Indomitable*," tells of this amazing true adventure. "*The King of the Southland Forests*," by Alexander Sprunt, Jr., is a vivid characterization of the wild turkey and its Southern woodland haunts. "*Nature's Giant Bridges*," by Guy Elliott Mitchell, reveals the majesty of comparatively unknown natural giant masterpieces, the work of erosion, in the silent deserts of Utah, and "*Cruising Amid Fiords and Glaciers*," by H. J. Lutz—a picturesque traverse of our Alaskan forests, are among the many good things in this number.

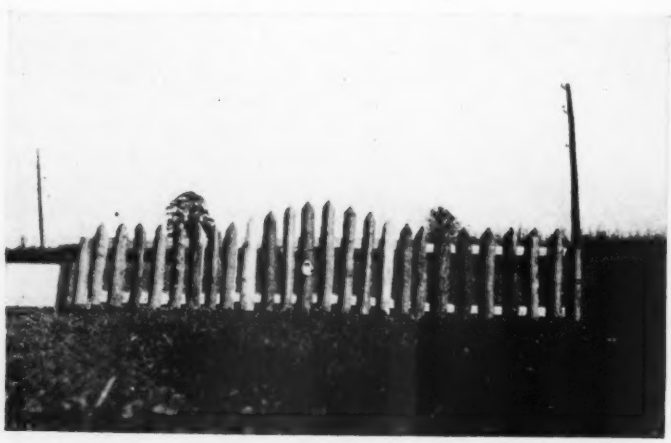
On and Off

—Courtesy New York Zoological Society

An acceptance of man's friendship. A camper in Mt. Rainier Park, Oregon, entered his tent to find this deer enjoying his bed

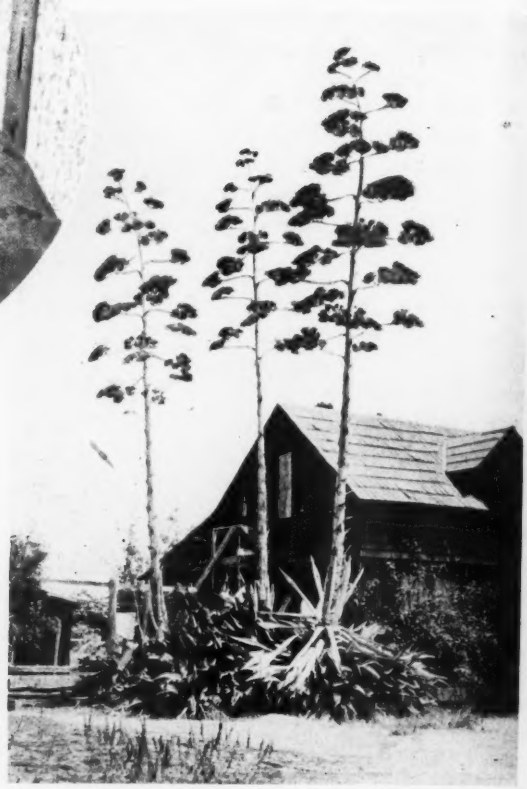
—D. H. Cochran

Natural graft between two pinon pine trees in Mesa Verde Park, Colorado. A limb of the tree on the left penetrates the trunk of the tree on the right.



—Creta S. Walker

Getting acquainted with the forest trees. Gate exhibited at the Loraine County Fair, Ohio, is made of twenty-six different species of wood.



—A. T. Hamor

Must be the California climate. Although only fifteen years old these century plants at Pasadena are in full bloom. The tallest is forty feet high.

—H. W. Warner

Three-year-old Robert Keith of Takoma Park, Maryland, planting a Norway spruce seedling at a tree ceremony in which seventy-five school children took part.

THE TRAIL

—John D. Guthrie

So this is America. Young European foxes, noted for their sporting qualities, seem just a little suspicious of their new forest home.

—W. H. Bertenshaw

Seventy-five years ago these four elms at Bridgewater, Massachusetts, were tied together to form an archway. Today they give the appearance of one giant elm with four trunks

—Jordan McDonough

Just as the twig is bent. This pine tree in the Rogue River Valley, near Medford, Oregon, grows as only a pine can grow despite a deformed trunk.

Paul Gilbert, forest ranger at Gardner, Colorado, posing a weasel for his picture. It seems to be quite a process.

—J. M. Preble

Forest curiosities found near the University of Oregon, at Corvallis. A branch that grew back into the tree; a deer antler, a wrench, and a trap all held fast in trees for half a century.

The Tree That Wouldn't Prune Itself

By Mabel Howland Wharton

THERE was once a foolish, lazy young tree which did nothing all day long but dream dreams of a day when it should travel to far cities. It would not prune itself, and keep itself neat and orderly as a growing tree should. It left small scraggy branches hanging and flapping all along its trunk from root to crown, and laughed at its brother trees which worked hard from morning until night. They pumped the food which their roots had gathered from the soil quickly past the useless branches, until they died. Then they squeezed and worked from year to year until the dead branches fell away and soon there was no trace of them on the smooth bark, and the trees were neat and straight and true.

But the lazy tree dreamed its foolish dreams, and gave just a little food to all of its branches, just enough so that they wouldn't die. That was so much easier than squeezing the branches off which took a lot of energy. "Anyway," it said, "I'll wait, and maybe some day a man'll come along and prune me and save me all of that trouble."

This went on from year to year while the young trees grew from seedlings to sturdy saplings. Then one day men did come into the forest. They were studying the trees very carefully.

"These trees will be good board lumber in about twenty years," they said, "the railroad'll be here then and we'll send them to the city, and build houses with them."

The lazy tree, hearing this perked up its head, and suddenly became ambitious. Here was a way to realize its great dream. "I'll do my best, and grow hard and fast," it said, "then some day I'll be taken far away and become a part of the most wonderful building in the world."

So from that day it did its best, and pumped quantities of plant food from the earth, and took it up to its crown and digested it, but lots of the good food was stopped on the way to be fed to the poor scraggy branches, and when it got through with these there was so little left that the crown didn't get much, and so the tree had a dreadful time trying to grow tall. Soon its brother trees with the slim, straight trunks far overtopped it. Now the foolish tree tried in desperation to get rid of the trouble-some lower branches, but they were very tough and died hard.

This went on for years and years until one joyous day men came and built a railroad far into the mountains. Woodchoppers came, and the sound of the ax and the saw was heard where it had never been heard before. The foolish tree rejoiced with all of its brothers. "Now," it said, "I'm going to travel and see the world."

Soon the tall, sturdy brothers were cut down, and put on the logging train. Men looked at the lazy, many-branched tree and shook their heads dubiously, but finally they said they'd take a chance, and so cut it down. Then away it went with its brothers to the sawmill.

The saw of the mill sang blithely as it cut true, perfect boards from the straight young trees, and men piled the boards high to dry out before they shipped them to the waiting builders. But when the saw started to cut into the tree which had been lazy and foolish in its youth it no longer sang. It screeched and wailed in anguish, and its even teeth were torn and dulled, and the mill had to shut down until the saw was repaired. The tree was so full of knots and imperfections that it made only twisted uneven boards showing great hard-grained darker spots where the tough branches had been.

On the day when the lumber was thoroughly dry and ready for shipping came the greatest disappointment of the lazy tree's life. Men started to pile the boards on the cars, in methodical, even rows, yet each time they took up a board from the lazy tree they were obliged to stop and throw it to one side on a heap of refuse that was waiting to be burned. For all of the hard knots that had formed where a tough branch had grown had shrunk with the drying, and now when the board was moved they fell out and left so many holes in the boards that they were perforated like a sieve. At last every one of the boards from the lazy tree had been cast aside. "We can't build houses with poor lumber like this," they said. So the lazy pine watched sadly from the dump heap while its sturdy, hard-working brothers were carried gallantly forth to build great buildings.

EDITORIAL

Overproduction and Its Cure

AT a recent meeting of the National Lumber Manufacturers Association in San Francisco, Mr. David T. Mason, a forester recognized for his clear grasp of forest problems, appealed to progressive lumbermen to lead their industry out of its chronic slough of overproduction by adopting the sustained yield principle of forest management. To the layman and, indeed, to many lumbermen, "sustained yield" doubtless is just a vague theory of technical complexity. As a matter of fact, it merely means that the owner of a forest property will limit his annual or periodic cut of timber to an amount equivalent to the annual or periodic growth of his forest. It is the principle of harvesting the annual wood crop while retaining a growing stock to produce future yields permanently and indefinitely.

But how, it may be asked, will the application of this principle serve as a cure to the present deplorable condition of overproduction in lumber manufacture. According to the Forest Service, the forests of the country are being cut four times faster than they are growing. Assuming that this estimate is somewhere near the mark, it will be apparent that if the lumber industry were to limit its cut to an amount equivalent to the annual growth of the forests now remaining, there would be a tremendous decrease in lumber production. Instead of a chronic oversupply of lumber, there would be a current undersupply. Lumber prices would go up, cut-throat competition within the industry would be eliminated, less lumber would be wasted, vastly greater utilization of the trees cut would be possible, stumpage values would increase, reforestation would be stimulated, and instead of rapid depletion of remaining forests there would be a gradual upbuilding of the nation's forest resources.

Mr. Mason, as a result of his appeal, did not expect any such millenium of forestry and lumbering to be accomplished forthwith. He recognized the intricate industrial and economic problems involved in liquidating the industry down to sustained yield and holding it there, but he did express the conviction that if more lumber companies, which are in a position to do so, will adopt the sustained yield plan of operation, overproduction will be in the way of an intelligent and permanent cure. It is to be hoped that the lumbermen and the public will lend more than a passing ear to his suggestion. That it is feasible for many companies to place their forest properties on a sustained yield basis is proven by the redwood operators of California, by the Great Southern Lumber Company of Louisiana, and by a dozen or more other companies that are now handling their lands under a permanent yield plan.

In the last analysis, the disease of overproduction, which has fastened itself on the lumber industry, is the worst sort of conservation. It spells accelerated forest destruction and needless waste of wood that will be badly needed in the future. Its causes are too deeply rooted to be discussed here, but many of them will be found in the present public attitude toward forest taxation, fire prevention and other conditions which only the public can rectify. The permanent cure of the malady needs the understanding and constructive help of the public quite as much as it does the labors of the lumbermen. It is a problem which ought to be frankly faced by both in a spirit of cooperative will to remedy the evil in the best interest of the industry and a future wood supply.

Sustained yield, the basic principle of all forestry, will effect a cure. The more lumbermen that adopt it, the speedier the cure. But how to bring it about more rapidly and more extensively? No one familiar with the economic and political set-up of forestry and the lumber business will delude himself into thinking that a change to sustained yield lumbering can be suddenly accomplished by a cut of the cards. Progress will be slow, at best, with permanent success and relief demanding, first of all, an immediate and authoritative survey or inventory of the nation's timber resources, rate of growth and other facts essential to a cold business analysis of present and ultimate possibilities of sustained yield lumbering. Without such an inventory serious and well-meant efforts may prove costly and short-lived, and may easily defeat the cure. An inventory of the kind needed can be accomplished only by the aid and will of the public. Certainly it is a wiser policy for the public to help the lumbermen to husband a substantial forest growing stock while it exists than to be a party to conditions which force overproduction, forest waste and speedy sacrifice of forest principal.

The Palisades of the Potomac

IN an address on "The Nation's Capital," in 1913, Sir James Bryce said: "No European city has so noble a cataract as the Great Falls of the Potomac, a magnificent piece of scenery, which you will, of course, always preserve."

The Great Falls of the Potomac River are within 15 miles of the White House. Below them for several miles the river pours through a rocky gorge, with palisades 100 or 150 feet high. The side streams break through these rocky walls in tumultuous cascades. Dense hardwood forests crown the summits of the banks and creep down to the river's edge at many points. Lower down, the river broadens into a beautiful wooded valley, with imposing cliffs still continuing on the Virginia shore, and numerous forested islands and bottom lands along the Maryland shore. Near the Great Falls on the Virginia side are remains of locks and a canal constructed by George Washington. The old Chesapeake and Ohio Canal, built in the 1830's, with its picturesque locks and lock houses, parallels the river on the Maryland side.

The gorge of the Potomac is the most strikingly beautiful natural feature in the vicinity of Washington. Its historical associations and relics are replete with charm and interest. It is one of the great outdoor playgrounds of the National Capital. It is an outdoor laboratory for the botanists and zoologists of Washington. To it resort the Audubon Clubs, Boy Scouts and groups of every kind interested in outdoor things.

It is difficult to believe that the applications now pending before the Federal Power Commission for the construction of two huge dams, one at the lower end and one at the upper end of the Potomac gorge, for the conversion of some forty miles of the river channel into power reservoirs, can receive the Commission's approval. These projects would destroy both the Great Falls and the Little Falls, flood out the old canals, destroy all the timber below the high flood levels and convert the channel of the river into lakes, whose water levels would rise or fall as the dictates of power development might require.

Such sacrifices are sometimes demanded in circumstances where there is a clear showing that greater public benefit would result from the commercial exploitation of our rivers and waterfalls. But in the case of the Potomac no such showing has yet been made. Apparently, the beauty of the Potomac gorge would be wrecked not to supply any existing economic need but to furnish with electric energy a hypothetical market that could be created only by industrializing the National Capital and its environs.

This is far from being an ordinary case. Washington is the Capital of the United States. The entire nation is justly concerned with the preservation of its dignity, beauty and charm. We should certainly pause before acceding to a project that involves the deliberate conversion of our National Capital into a factory town. Few cities in America have the opportunities for preserving natural beauty in their immediate environment that are available to Washington. For this we must thank the sagacity of the first President, who selected its site and who knew the lower Potomac as few other Americans have ever known it.

The issue between the destruction of a spot of rare beauty, rarely placed for public enjoyment and national appreciation, is squarely joined. The American Forestry Association is firmly of the opinion that the primary consideration in the use made of the palisades of the Potomac River is how this area will best contribute to the beauty, dignity and national distinction of the Capital of the United States. We believe that no showing of public benefit or civic need has yet been made that would justify the virtual destruction of the Potomac gorge as a thing of beauty or the abandonment of the long-standing project for incorporating this section in the park system of Washington.

Editorial Ethics

IN the August issues of the *Outlook* appeared an article, "Why Our Forests Are Burning Up," written by a former member of the United States Forest Service. The writer, in some very sweeping charges, takes the Forest Service to task for its administration of fire protection on the National Forests. His article constitutes a serious charge that the Forest Service, through incompetence, bureaucracy and concealment of facts from Congress and the public, is signally failing to protect these great public properties from fire.

Commenting editorially, the editors of the *Outlook* represent the author's assertions as statements of fact, based upon the writer's experience and knowledge as a former member of the Forest Service. They call upon their readers to send the article to members of Congress and to call it to the attention of clubs, civic bodies and public leaders, intimating that a reorganization of the Forest Service is necessary to save the National Forests.

Before asking the public and members of Congress to accept the writer's assertions that a great public property is being mishandled and dissipated as statements of fact, the editors of the *Outlook* owe it to themselves and their readers to tell the public something about the record of responsibility of the writer during the time he was a member of the Forest Service, and the circumstances surrounding his withdrawal from that organization. When the *Outlook* has done this, it will have fulfilled an obligation of editorial ethics by giving the public information which will enable it to form its own judgment of the writer's competency to make an unbiased and judicial analysis of the management of the National Forests.

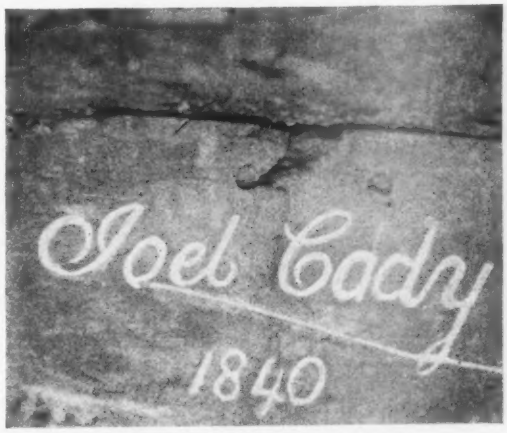
Wood In Service Fifty Years

REUBEN W. SMITH

"So the deacon inquired of the village folk,
Where he could find the strongest oak
That couldn't be split, nor bent nor broke."
—OLIVER WENDELL HOLMES.

AND like the Deacon, the builders of the lock gates of the once famous Erie Canal must have searched far and wide for the timbers that would best suit their needs.

The Erie Canal is no more. Clinton's Big Ditch is passing into history. The demolition of this feat of engineering, unparalleled in its day, is proceeding rapidly. Once an important link in water highways east and west, passing through what are now some of the largest cities in New York State, this grand feat of the early 20's of the last century is no more. Yet the pioneers in water transportation builded well, for part of the old Erie Canal system is incorporated in the present New York Barge Canal. Few vestiges of the old canal remain.



THE INSCRIPTION ON THE CORNER-STONE OF THE OLD WOODEN LOCK

The Erie Canal, started in 1817 and opened in 1825, was a monument to De Witt Clinton, twice governor of New York and a candidate for the presidency with Madison in 1812. The canal was originally a ditch 4 feet deep, 40 feet wide and 363 miles long and in 1825 a fleet of canal boats left Buffalo, went through the canal, down the Hudson and into New York Harbor.

All credit to these pioneers in transportation. Huge stones, quarried by hand from native rock, each weighing a ton or more, lined the canal locks. They were finished with painstaking care and set in place by hand. Teams of sturdy horses and of oxen drew the stones on rough log sleds over the snow to the lock site. Hardy woodsmen, ax on shoulder, plunged into the woods seeking the best and toughest oak that had endured the storms of years, sought the

(*Continued on page 623*)

AFTER FIFTY YEARS OF PUBLIC SERVICE, THE WOOD OF THE OLD LOCK WILL BE USED TO REPLENISH THE FUEL SUPPLY OF THE TENDER OF THE GATE

AN INTIMATE GLIMPSE OF THE HOME LIFE OF THE TERN—WHILE A MOTHER BROODS ON THE NEST, THE TWO ABOVE HOVER PROTECTINGLY IN THE AIR

WE HAD NO MORE THAN LANDED ON THE BEACH WHEN THE STORM BROKE—PHALANXES OF TERNS FILLED THE AIR, SWOOPING ABOVE AND AROUND OUR HEADS, CHALLENGING THE TEMERITY OF OUR INVASION OF THEIR SANCTUM—A STORM OF SILVERY WHITE AND GRAY, SUDDENLY COME TO LIFE FROM OUT TEN THOUSAND NESTS

The Battling Tern

By Charles A. Parker

IF THE tern possesses any one quality superior to that of other birds it is courage. Unlike the specially equipped flea, the hedgehog or the pole cat, this little sea swallow fights with bare knuckles and he, or she as the case may be, never "lays down!"

I make the assertion because I have proved the fact. We, Cap'n Wilbur Patterson, Cape Cod veteran of ships and the sea; Leslie Jones, newspaper bloodhound photographer, and I, battled with these birds in their lair and at the end of an hour retreated—in defeat.

Tern Island, their sanctuary, is a mile-long bit of sand dune grass-land flung down off Cape Cod, at Chatham. Here Massachusetts, in the guise of its Fish and Game Commission linked with the Federation of Bird Clubs, of New England, has set the tern on a pinnacle.

For here the northward migrating tern can hang up his hat and stay awhile without fear of molestation. And here, it appears, all the terns in the world have laid out lots for summer homes, pulled in the latch string and gone to housekeeping. The two-legged creature known as man is today as welcome at Tern Island as a wasp at a picnic—and not more so.

We, the Cap, Leslie and I, made our debut at Tern Island at the inopportune moment when Ternland was replete with the season's crop of babies. A tern may purr when stroked at certain psychological seconds in its career, but the hatching season is not one of these seconds.

When our trio stepped over the gun'le of the Cap's dory, a fine morning in very late June, there was not the slightest doubt that choosing this day and date for our adventure was distinctly a *faux pas* in the etiquette of the tern. And the fathers and mothers were there *en masse* to prove it.

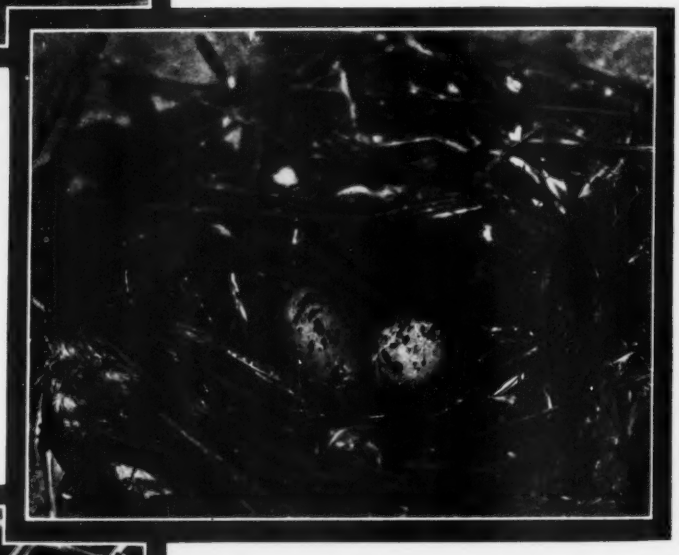
The Captain's previous warning to the effect that terns at home were "mighty onery cusses" had to our minds appeared like a bit of fo'c'stle exaggeration. But

the beach sand barely grated under the bow when it began to appear as if the Captain's suggestion was based upon fact. The terns were there to greet us—with their war paint on.

Leslie, handicapped with graphlex and photographic plates, galloped naively up the beach unlimbering equipment as he went. As we reached the grass-land fringe the storm broke.

Neither of us had dreamed that there were so many terns in all the world. That initial flurry at the water's edge had been but as a lone battalion compared to the phalanxes of terns that now swept upward in billows and clouds, and poised, whirled and swooped through the air above and around our heads. It was a storm of silvery white and gray, flecked with black, suddenly come to life from ten thousand nests.

They were at our heads from the beginning. Enraged beyond thought of fear at our invasion of their settlement they began a series of combined and individual drives that continued unabated during the approximate hour of our stay. It was difficult to ascertain whether the attacking birds were owners of the nests to



ABOVE—FOUR OF A KIND IN A NEST AT TERN ISLAND

MIDDLE—THE FAMILY HAS STARTED TO ARRIVE, ONE BEING ALREADY ACCOUNTED FOR

BELOW—"I WANT MY MA!" SHOUTS THIS TERN YOUNGSTER, IN NO UNCERTAIN VOICE

which we were nearest when attacked. They came on in groups of six to twelve, taking irregular turns in the assaults.

Observing Leslie, I noted many individual birds executing the attack manoeuver. The tern started its downward and forward drive at about a twenty-foot distance from the objective, the photographer's cloth-capped head. A tern's attack upon man, it seems, is always against the wind. It dove like a lance, struck, recovered with a quick swoop upward and forward, turned, glided back to position again and began execution of the same manoeuver. The birds carried on similiar tactics with my own head. My frantic hand waving failed to deter these little furies from darting in with bill

stroke and leaping away again. History in tern life is made on this island. The day of our arrival proved auspicious in that the myriad of nests here at that time contained either eggs or both eggs and babies. We saw broken shells in many nests but were not fortunate enough to discover a birdlet in the moment of making his debut from the shell wall. Terns evince no lack of energy either as aviators and foragers or when aroused to defend their young but as home builders it seems they are quite deficient in enthusiasm. In the far greater number of instances here the bird seemed content with shaping a slight depression in the fine soft, dry sand and calling it a day.

AN ATTACKING PARTY. THOUGH BENT ON DESTRUCTION OF ANY INVADER—OURSELVES IN PARTICULAR! —THE TERNS IN FLIGHT MADE AN UNFORGETTABLE PICTURE AGAINST THE GRAY SKY—THE EPITOME OF VIGOROUS GRACE AND BEAUTY

Tern Island, seen in perspective, is an elongated level of low ground, profuse with billowing beach grass which undulates in the sea breeze usually prevailing here. A closer view, however, discloses many patches of ground where there is little or no grass.

All open patches were preferred nesting places. Other nests were at the edges rather than within the grassed areas. Some birds rose from the grass tangles, however, and we found a few nests hidden here and there. Differing from the sand nests these were composed of withered grass rather roughly and sketchily entwined—entirely lacking the art and technique of most of the nest-building birds. Plainly, the tern has only a casual regard for the nest itself; he much prefers sand in nest building since no work is necessary other than a few rollings of the body and some quick thrustings of the legs backwards to make a depression sufficient to keep the eggs from rolling away. He builds in the grass only when forced to do so because sandy areas are already preempted. Nests in the sand were built various distances apart, some as close as two feet; others, five, six and up to ten feet apart. Also there were certain hard, peaty spots where there were no nests.

The air was filled constantly with a bedlam of noises, whistling needle-like notes from birds higher up, and raucous, grating, angry sounds of birds swirling close above us. A stick would have proven useful as an intimidating instrument against their assaults. I removed my hat and substituted a light overcoat as a head covering, but quickly changed back after a half dozen bill thrusts against the cloth over my skull had all but caused abrasions and developed decidedly painful spots beneath a rather attenuated hirsute protection.

(*Continued on page* 620)

Early Forest Plantation of Oregon

By Lee P. Brown

LODGEPOLE PINE PLANTATION ABOUT THIRTY-FIVE YEARS OLD

OREGON contains one-fifth of the virgin timber in the United States. Consequently most of us conjure pictures of her extensive forest clad mountains when Oregon timber is mentioned; but Oregon does contain forest plantations that have reached considerable age.

The photograph shows the plantation of lodgepole pine on the W. E. Nickolson ranch at Fort Klamath, Oregon. There are other plantations in the same valley, though this is one of the oldest. It covers about five acres with the trees in rows approximately ten feet apart and spaced from four to eight feet in the row. The trees average thirty feet high and run from eight to fourteen inches in diameter breast high.

Mr. Nicholson, who has owned the ranch and plantation for the last twenty-seven years, says that the planting was done thirty-five years or so ago under the old Timber Culture Act by a Mr. Sheppard. He says that the trees have grown rapidly in the last twenty-five years and that he wishes he had another plantation just like it.

This plantation has been reduced from original size by cuttings for wood and posts and by an infestation of mountain pine beetle. It offers a good example of what lodgepole pine will do in a plantation on a good site, if given a chance.

Plantations as Game Preserves

(*Continued from page* 583)

matter of the season in the larger interests of patriotic duty, my friends and neighbors always have a deer-hunt on the Fourth of July; and, of course, always on Christmas and on New Year's Day. At such times, there is likely to be much more hilarity than real hunting, and the damage done to the deer will be slight. I remember with some amusement how a certain bride, recently married to a native of that country, tried to persuade her husband to abandon for her sake the heathenish custom of hunting on Christmas Day, and instead to go to church with her; and how, because of the incredible affront to a Carolina hunter, the request almost precipitated a family upheaval.

The cover on the plantations for deer is remarkably good, chiefly because there is so much evergreen. They have warm and fragrant myrtle thickets, solitary coverts of sweet bay, gallberry, and young pines; tangled wildernesses of sparkleberry, of holly overrun with smilax, of all that greenery that sometimes succeeds the taking off of big timber. Most of the large timber has been removed; and in that region, growth is so fecund that the lesser things of the forest, particularly the vines such as the cherokee rose, the jasmine, the smilax, the tiger-briar, the supplejack, and the tie-tie form cover so dense that a man is almost baffled to penetrate them, and is quite helpless on horseback. But such conditions are ideal for deer.

I have said that these plantations are deserted. Most of them are. But here and there will be a negro cabin, the owner of which always complains of the depredations of deer, which devour his young corn, his sweet potato vines, and even his cotton. That so much waste land should remain useless seems a pity; yet gradually it is being taken up by hunting clubs that are taking advantage of the wildness and the isolation to establish sanctuaries and preserves for game. And I know that it takes very little encouragement from man, the alleged lord of creation, to make wild things comfortable and happy. Whatever land is worthless to us they will take and enjoy; to put it more truly, they will recapture gladly their ancient heritage, wrested from them temporarily by the invading enemy.

So, when any one interested in American wild life calls to mind the regions most favorable to the protection and the propagation of game, he should not overlook that romantic, wild, picturesque region of the great Southern plantations; the region of the yellow pine and the live oak, the jasmine and the magnolia.

Rising From The Gleaming Whiteness Of Its Marble Terraces, The Great Temple Was Painted With The Rays Of The Setting Sun— Dull Red And Brilliant Gold, And The Mystery Of Cobalt Blue

Where East Meets West

By Sara Wrenn

IT was shortly before Christmas, the day of the Winter Solstice, when, in the olden days it was customary for the Son of Heaven to pray and make sacrifice to the Deity, that I first visited the Temple of Heaven, that most sacred and beautiful of all of China's temples.

Trusting the hour was too late—and, incidentally, too cold—for anyone else to be about, I directed my rikshaw boy to wait for me at the gate, so that I might enjoy to the utmost, alone and undisturbed, my first view of the great structure. The rays from the dying sun glorified the whiteness of the marble terraces; the dull red and gold walls, the roof of cobalt blue, with its glittering, golden finial.

I visited the temple many times during my months in Peking. I saw it under many different conditions—when the snow covered it, its minor temples, weighed down the branches of the guarding cypress trees, topped the high encircling walls of faded red; when it gleamed and scintillated under the rays of the rising sun; when the great bulk rested, shadowy and at peace, in the moonlight—and always I loved it. But it was not until shortly before my departure that I learned that the great pillars supporting the massive roof were from not only my own country, but from my own native state, Oregon, where the big trees grow.

The "Great Lofty Shrine," as it is called by the Chinese, is said to have been first erected in 1420 by the ruthless, but empire-building monarch, Yung Loh, who because of the hatred he had inspired by his cruelties in the old capital of Nanking (Southern City) transferred his court to Peking (Northern City) and thereby made that the capital.

The temple, faced at a distance by the great open Altar of Heaven, sets among stately old cypress trees in a high walled park, some three miles in circumference, south of Chien Men Gate, outside the Chinese city.

Twice a year for centuries,—once at the Summer and once at the Winter Solstice,—the Emperor, in a yellow sedan chair, resting on the shoulders of sixteen

(*Continued on page 623*)

A Century of Forest Fires

By T. Schantz-Hansen

THERE is illustrated here a page from one of Nature's histories, written in the language of the trees. It records in a language of its own events of a century. This is the story that it tells:

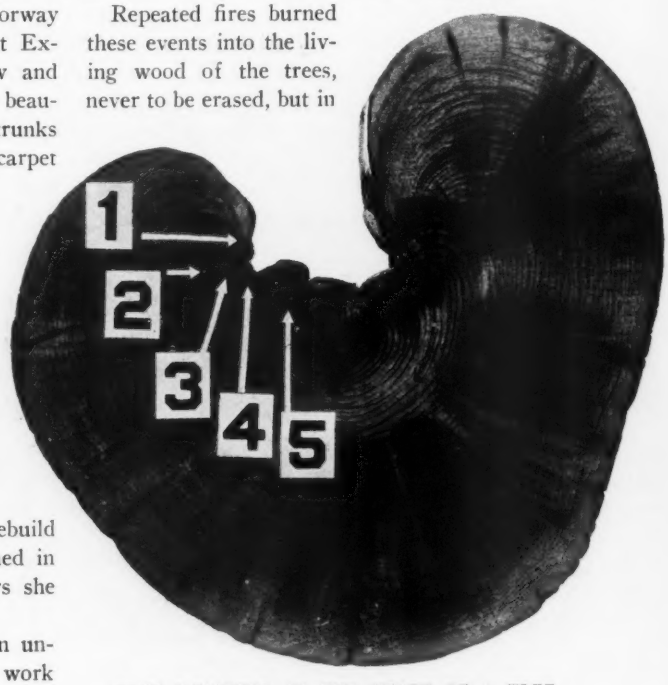
In 1620, or thereabouts, when the first settlement of our country began, nature planted a stand of Norway pine on the area which is now the Cloquet Forest Experiment Station in Minnesota. This stand grew and developed into a splendid forest, presenting a really beautiful sight with its straight, clean, reddish brown trunks glowing in the sunlight and underneath, a fine carpet of silky brown needles, soft to the touch and sweet to the smell. Nature's history tells of two hundred years of peace and quiet. There were years of drought and years of moisture, years of heat and years of cold, but no great catastrophe or cataclysm.

Then in 1819 came disaster. Fire swept through this wonderful forest and destroyed nearly all of it. The cause of the fire no one knows. It may have come from lightning or from an attempt by Indians to improve a hunting ground. Nature does not always record the cause. With inexhaustible patience she began to rebuild the work of centuries. With the seed left unburned in the ashes and with seed produced by the survivors she planted a new stand.

For 22 years the work of reconstruction went on unhampered and at a rapid rate. Then in 1842 the work of rebuilding was nearly destroyed, for another fire burned the area, killing many of the young trees. Fortunately nature had planted enough trees to provide for just such a contingency.

Thirteen uneventful years passed, during which the damage was repaired. But in 1855 fire came again. Wounds caused by the previous fire were not yet healed. This second burning served to aggravate the old wounds and make them more difficult for nature to heal. For nine years there was no further break in the reconstruction. Then in 1864 there came another fire,—followed by yet another in 1874. And in 1894, the year of the well remembered and terrible Hinckley fire, nature wrote her last record of fire on this living page.

Repeated fires burned these events into the living wood of the trees, never to be erased, but in spite of all the wounds and handicaps, the forest won its way back. It takes a keen or trained eye now over this fire-torn area to select the remnant of the original stand from the younger stand.



FIRES RECORDED IN THE HEART OF A TREE
The first (5), according to the tree's own story, occurred in 1842; the second (4) in 1855; the third (3) in 1864; the fourth (2) in 1874; and the last (1) in 1894, the year of the great Hinckley fire.

The Battling Tern

(*Continued from page* 617)

Wherever we moved these gallant home defenders continued their assaults against our marauding. I could not escape. Neither could the redoubtable-hearted Leslie.

And when finally we gave way, and retreated we stood at the water's edge and saw with a backward look they were still there in threatening squadron formation, angrily courageous and prepared to renew the assault had we given evidence of renewing our incursion into their sanctum.

The Soapberry Grove of Valley Center

By George Ballard Bowers

WHAT first attracted our attention was an unusual-looking grove of trees along the roadside. It might, from all appearances, have been English walnuts except that the English walnut does not grow fifteen hundred feet above sea-level in the foothills west of San Diego. So we stopped, and an inspection of the trees only added to our bewilderment, for we found that neither of us could name them. They were not in fruit so that aid to identification was unavailable.

Curiosity overcoming us, we knocked at the door of the neat bungalow that stood beside the grove. No answer. A trip of exploration around the house to the rear door disclosed no living occupants but revealed a comprehensive collection of geological specimens and racks of bird skins drying in the sunshine.

Just as we were about to leave, a man and woman and drove up—evidently the occupants of the bungalow. The man was about 50 years old, tall and of the Western miner type of the early '90s. Their name, we learned, was Howard.

W. O. HOWARD, WHOSE FAITH IN THE POSSIBILITY OF GROWING SOAPBERRY TREES IN CALIFORNIA IS JUSTIFIED BY THE FINE GROVE IN WHICH HE IS STANDING, PLANTED OUT IN 1917. THE SMALL INSET IS A CLOSE UP OF A SOAPBERRY CLUSTER

Apologizing for our trespassing, I pointed toward the grove and asked: "What are those trees you have planted there?"

"Those are soapberries," replied Mr. Howard, smiling.

Then my memory flashed back to the time when, in China, I had seen soap "picked" from trees and how the women there used the crushed pulp for washing their thick black hair.

"How did it happen that you became interested in the soapberry of

China?" I asked.

"Ask Mrs. Howard, she is responsible."

I turned to Mrs. Howard.

"Well, some years ago," she said, "I came across an article in a garden magazine, telling of the usefulness of this soapberry. I thought it might grow well here in Valley Center and perhaps, in time, aid in reforesting our denuded mountains. After much correspondence I was able to get a quantity of seed from the owner of a soapberry tree in Florida. I soaked the seed twenty-four hours, and planted them in a mixture of leaf mold and sand, about one and a half inches deep, in earthen pots nine inches in diameter. Only one seed was planted in each pot. After a year in the pots I set them out in ground that had been plowed to receive them. That was back in March, 1917. At present my grove contains a hundred and sixty trees, which have grown rapidly and borne small quantities of nuts after the second year."

"Will cuttings grow in this climate?" I asked Mr. Howard.

"Yes, I find that the soapberry may be grown from the cuttings, but to insure growth the cuttings should be taken from trees at least five years old. Only in the last two years have I been able to get any cutting to grow."

"What have you done with your annual harvest of nuts?"

"Well, you see our trees have not yet produced large quantities. Last year I had six bags for which I received ten cents per pound from a San Francisco dealer."

The soapberry tree, *Sapindus Saponaria* as it is known to the botanist, has had a rather restricted history in this country. First brought from China, about 40 years ago, by a returned missionary, seeds were planted near Jacksonville, Florida. Only one lived to produce a tree, and in 1911 this Florida tree was the only one known to exist in the United States. It was this solitary specimen that furnished the seed for Mr. Howard's grove.

The soapberry resembles the English walnut in appearance and the grove Mr. Howard told us, is usually mistaken for that species. The fruit grows in clusters like a loquat, the berries attaining the size of a very large cherry. The pulp surrounding the seed contains a saponaceous juice yielding a large percentage of saponin of commerce.

The seed is about the size of a large cherry pit and yields an oil which is used in China for cooking and is said to be equal if not superior to the finest olive oil.

Divested of the outer pulp the seed is very hard, black and glossy. Quantities were once imported from China to Europe to be made into waistcoat buttons, and tipped with silver or other metal, they were wonderfully resistant to injury or wear.

The leaves are greedily eaten by all kinds of stock and in China the seeds after the oil is extracted are excellent food for poultry and stock, serving as does cottonseed cake in the United States.

The wood of the tree is close-grained and admirably adapted for furniture. In color it resembles orange wood. In China this valuable tree grows to timber size but is protected by law because its fruit is worth from ten to twenty dollars annually—a sum that would go far in keeping up family expenses in that over-populated land.

A Sunset

Hint of gold and tint of gray
Slowly fades the day away.
Through the latticed window casement,---
See the branches' interlacement---
Silhouette of branch and tree
Swaying free.

Darkling shadows seem to lie
'Neath the pine trees, rearing high,
Limned against the western sky;
'Gainst the twilight's purple tinting,
And the lights of evening glinting
O'er the bay.

—*Florence Nickerson Houdlette*

Wood in Service Fifty Years

(*Continued from page* 613)

clearest and finest white pine, the most durable and hardest birch. This for the lock gates. The huge timbers were hewn from the solid log and brought overland many miles to their last resting place.

Near the corner of what is now Townsend and Water Streets, in Syracuse, New York, stood a massive and sturdy lock, its stone walls after nearly three-quarters of a century still intact. Its huge gate of wood after half a century of service is still in good condition. A short time since, a modern steam wrecking crane capable of lifting 25 tons or more was busy in tearing down stone wall and gate. The sturdy construction of the gate itself, and the efforts of the huge machine as it strained to rend the gate apart that it might more easily be handled, was a struggle well worth watching. The wood beams of the gate seemed to defy the efforts of the huge crane in lifting them from the place in which they had rested all these years.

The old gate finally lay on its side among the debris of stone. Upon close examination only a very small amount of decay was found in the wood. Practically the whole gate was still sound and good and fit for many more years service.

The gate was about sixteen feet high and thirteen feet long. The cross timbers, crown and braces were of white oak ten inches square; the ends and facings of solid birch five inches thick. Some white pine from four to six inches thick was used in the facing. It is estimated that the old gate weighed over thirteen tons. It was iron braced and bolted, and nailed with the huge awkward "square cut" nails of a past generation.

The birch and pine wood mellowed by time and use had weathered to a beautiful bluish grey color and the oak to a pleasant shiny amber.

Since we know that wood such as was used in this gate when exposed to the weather and set in places of dampness is very susceptible to decay, the fact that the wood in this lock gate has persisted all these years is little short of marvelous.

Where East Meets West

(*Continued from page* 619)

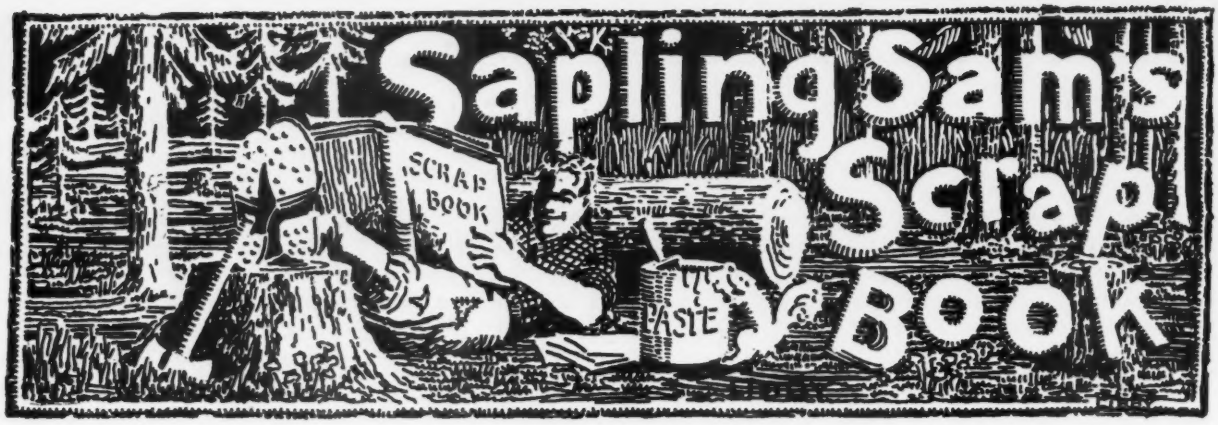
husky carriers, was borne to this shrine over a road freshly smoothed and covered with clean yellow sand, to intercede with the Supreme Deity in behalf of his people.

Circular in design, the temple, with its three-tiered roof of lapis-lazuli blue tiles, surmounted by a great golden ball, rests on a beautifully sculptured white marble base of three terraces, from which it towers upward a hundred feet or more. According to Bushell, an authority on Chinese art and architecture, "the great weight of Chinese roofs always necessitates the multiple employment of the column, which is thus assigned a function of the first importance. . . . . The stability of the structure depends upon the framework; the walls, which are filled in afterwards with blocks of stone or brickwork, are not intended to figure as supports; the space, in fact, is often occupied by doors and windows, carved with elegant tracery of the most flimsy character. . . . . Curiously analogous to a modern American building of the newest type, with its skeleton framework of steel, filled in with dummy walls."

The sixteen columns that support the roof are fully three feet in diameter. Four of the columns, exquisitely lacquered, support the topmost tier, while the remaining twelve, of plain red, support the two lower. The ceiling and walls, with a background of red, are gorgeously decorated with the sacred dragon and phoenix in brilliant colors. The windows are covered with wooden screens of intricate openwork.

In 1889, the great temple was struck by lightning and destroyed—the result, according to Chinese belief, of a centipede having dared to climb the golden ball! In the restoration of the building no timbers of the size of those formerly used could be found in China, and thus it was that the straight and stately tree trunks were imported at enormous expense and difficulty from the forests of Oregon.

So they stand, those majestic pillars from half across the world, upholding the edifice of a country's religion, that may be said to be, like that country's emperor, of the historic past.



Round River Yarns

V. TYIN' UP ON THE ROUND RIVER

By Roland Henrionnet

"AFTER sluicin' thim logs over the falls we wint on down the river an' pretty soon gits past the timber line an' thar war prairies on each side of us with jist a bunch of popple here an' thar.

"Sez I to the cook, 'We are liable to see a herd of buffalo most anytime now. If I had a high-powered rifle you'd have sum buffalo steak.'

"The cook, sez he, 'I bane got a high-powered rifle me uncle killed elephants with. I'll sell it to ye fer a hundred dollars.'

"Sez I to the cook, 'If thot gun ye spake of is high-powered enuff to kill elephants it's the gun I want. Bring it out this afternoon an' we'll try it out.'

"About an hour after dinner the cook calls to me an' I goes over to the wanegan. The cook had put up half a dozen targets with big bulls-eyes on thim, on sum popple trees. Thin he brings out a gun what looks like a twenty-two calibre gun an' hands it to me.

"Sez I to the cook, 'I'm no kid an' don't figure on huntin' rabbits.'

"'Try it out,' sez the cook, 'It bane one high-powered gun an' if it don't blow thim trees to pieces don't buy it.'

"Wall, I takes good aim an' shoots at the furst popple with the target on it. The popple tree war about six inches through an' I'll be jiggered if thot bullet didn't tear thot popple right in two. I tried it agin an' another popple fell, tor right in two whar the bullet had hit it.

"'Thot's the gun fur me,' sez I, an' I hands the cook a hundred dollars.

"The next day I seez a herd of buffalo comin' toward the river an' I runs to the wanegan an' gits me gun. The cook follows me out to see what the trouble war.

"'I bane goin' to watch this yere preformance. I thank maybe you bane a regular Buffalo Bill,' sez he.

"Thot war the furst buffalo I ever see an' I war a bit nervous, but thinks I, ye've got to show thot cook how to kill buffalo. I gits up pretty close to a big bull an' takes good aim an' shoots. Wall, sir, thot bull jist raised his head an' his tail, lets a snort out of him an' comes a'tearing right toward me. I shoots agin, but he niver stops. I seez thar warn't time enuff fer me to git away, so I jist jumped into the air an' whin I comes down I war goin' toward the wanegan about twenty miles an hour on the back of thot thar bull. I seez somethin' white near the wanegan an' I knows thot bull is after the cook, so I lets him go. Wall, jist about thot time the cook lets a whoop out of him an' runs into the wanegan. I pulls out me jackknife an' jabbed the blade into the critter's heart. He fell with his head restin' on the wanegan's deck.

"Sez I to the cook 'Ye surprize me in yer jidgment of guns. I'm goin' to examine thim trees I shot to pieces to-day an' if me suspicion is kerrect, the cook of this yere outfit will be out of sour-dough, if I don't find a hundred dollars lyin' aroun' somewhere.' I wint over to the popple an' the furst thing I finds wuz sum pieces of exploded dynamite caps. Me hundred dollars war lyin' on the buffalo whin I gits back.

"It war jist plain drivin' fer the next month an' thin we gits to the big timber agin. The men war gittin' pretty tired of drivin' logs an' not gittin' anywhere. Most every mornin' thar would be ice in the river.

"I war goin' toward the wanegan about twenty miles an hour on the back of thot thar buffalo."

"Thin one day, while I wuz polin' the wanegan along behind the drive, I seez the old camps whar we had cut the logs. We had gone all the way aroun' the river.

"Thar war so much ice in the river thot the boss decided to tie up fer the winter, build a sawmill in the spring and saw thim logs right thar.

"The Round River? Wall, now, thot is a question. It ain't anymore. I have heard thot the winter Paul Bunyan pulled out of here, thot war the last winter the Atlantic Ocean froze over, thot Paul hitched his blue ox, Babe, onto the river and hauled it over to Europe. Sum folks sez thot they heerd a German count bought it from Paul and used it fer a moat aroun' his castle. An' thin again, I have heerd many say that it jist dried up."

$15,000.00 in cash prizes for a slogan about WOOD

Read the fascinating story of Nature's most friendly and useful material. Know more about its beauty, durability and economy. Learn the truth about America's vast and permanent supply of timber. Then send us your slogan!

This message may mean $5,000 to you. And remember that these slogan contest prizes are seldom won by professional writers or technical experts. Nearly always the winners are people who never expected to win. So do not skip anything—not one word.

No timber shortage

Almost everyone has been induced to believe that this country is confronted by an acute shortage of timber. This is not true.

In fact, Col. William B. Greeley, U. S. Forester, urges the nation to "Use wood and conserve the forests." For timber is a *crop*. It needs to be cut when ripe. Failure to do so means *waste*.

There is enough standing timber in the United States today to build a new six-room house for every family in this country, Canada, South America, all of Europe and the entire British Empire! And the *additional* lumber supplied by the *yearly growth* of standing trees would build a continuous row of these houses along both sides of a street reaching from New York to San Francisco.

These are not "opinions" but *facts* backed up by extensive investigations and published reports of the United States Forest Service.

Better lumber than ever

Not only plenty of lumber—but *better* lumber! Today, *American Lumber Standards*, adopted by the industry and endorsed by the U. S. Government, give the purchaser protection he never had before.

Universal adoption of reliable standards has won for the Lumber Industry high praise from Secretary of Commerce Herbert Hoover.

Wood built America

Without wood there could have been no America!

Stout wooden ships brought the settlers of America across the wide stretches of the stormy Atlantic. Wood sheltered them in sturdy log cabins and wood housed their descendants in colonial mansions—many of which endure today.

Throughout the Thirteen Colonies wood built the homes, the churches, the town halls, the schools. Wood built the wharves, the warehouses, the stockades, the barns, the corn cribs, the bridges.

Later, the Forty-Niners battled their way over the long cruel trail to California in covered wagons made of wood. On ties of wood the railroads advanced unceasingly, West, East, North and South.

Uses constantly increasing

Twenty years ago there were less than 2600 commercial and industrial uses for wood. Today there are more than 4500.

From the staunch timbers in mine shafts to the buoyant strength of Lindbergh's immortal plane, wood serves mankind in countless and ever-increasing ways.

Wood endures

The oldest and most beautiful homes in America are houses built of wood. Many of them stand today, as sound in timber and beam, and *as livable*, as they were before the Revolution.

Wood endures—and the supply is enduring. It is the only one of our natural resources that *grows*. The mine becomes a gaping hole; the forest forever *renews*.

Wood is beautiful

Wood possesses a pleasing natural beauty of grain and texture that mellows and deepens with age and defies imitation. Wood can be fashioned and carved and fitted into thousands of charming designs.

And surely it is significant that the American architect prefers lumber for his own home!

Wood is friendly

Of all materials there is none so *friendly*, with such a sense of human companionship as wood. Wood is warm and alive to the touch. The handle of a tool, the steering wheel of your car, the arm of your chair, the bowl of your pipe—you like the feel of them because they are wood.

Wood is economical

Wood is stronger, pound for pound, than any other material. It is easily and cheaply fitted to special forms for special needs. Its moderate cost is due today, in no small measure, to the elimination of waste. There is a grade of lumber for every purpose, a right wood for every need.

* * *

To inspire renewed and greater appreciation of wood, and to make more widely known its almost endless variety of uses, manufacturers of American Standard Lumber in the National Lumber Manufacturers Association are preparing an extensive educational campaign. The first thing the Association wants is a "slogan." Send your coupon *now!*

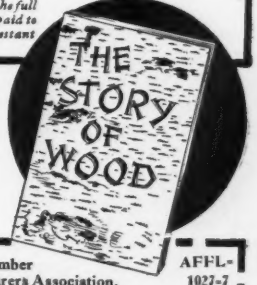
NATIONAL LUMBER MANUFACTURERS ASSOCIATION
Washington, D. C.
Manufacturers of American Standard Lumber

This free booklet may mean $5,000.00 to you

Send today! Mail coupon below and booklet will be sent you postpaid. It contains the *Official Blank On Which Your Slogan Must Be Submitted*. This may mean $5,000.00 added to your bank account. So mail your coupon right now.

First Prize	$5,000
Second Prize	2,000
Third Prize	1,000
Four Prizes (each) . .	500
Fifty Prizes (each) . .	100
Total	15,000

In case of tie, the full prize will be paid to each tying contestant



Contest closes December 15th

National Lumber Manufacturers Association, P. O. Box 811, Washington, D. C. AFFL-1027-7

Gentlemen:—I want to enter your $15,000 Prize Slogan Contest. Please send me free copy of your booklet, "The Story of Wood," so that I may qualify.

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*State*_____

AROUND THE STATES WITH THE AMERICAN FORESTRY ASSOCIATION

Florida Names Forestry Board

Appointment of members of the newly created Florida State Board of Forestry has been announced by Governor Martin. Those named were H. J. Wicker, Coleman, former State senator, for a term of four years; A. A. Payne, Panama City, banker, four years; E. W. Tharpe, De Funiak Springs, naval stores operator, three years; S. Bryan Jennings, Jacksonville, attorney, two years; Simon Williams, Jacksonville, attonery, one year.

The Florida forestry bill passed both houses of the States legislature and was signed by the governor early in June. It provides for a non-salaried board of five members and for the employment of a state forester. The sum of $25,000 was appropriated for the next two-year period. The governor has not yet appointed a state forester.

Forest Fire Damage $27,000,000 Last Year—24,300,000 Acres Burned

Forest fires reported during 1926 caused direct damage amounting to about $26,900,000 in the United States, according to figures compiled by the Forest Service, United States Department of Agriculture. This immense loss is the result of 91,793 fires which burned over 24,300,000 acres of the lands of the country.

More than 72 per cent of the fires are known to have been caused by man and 12 per cent by lightning. The causes of a little more than 15 per cent are unknown. Smokers lead all others as starters of forest fires with over 16 per cent of all, railroads come next with 13 per cent, and brush burning third with 12 per cent.

Mississippi, with 23,170, suffered more fires than any other state. Alabama was next with 14,953, and Georgia was third with 6,446. At the other end of the scale, Delaware had but 37 fires, Rhode Island, 43 and Vermont, 73.

The Southeastern States as a group—the Carolinas, Georgia, Florida, Alabama and Mississippi—had the most fires, 54,200. The West Mississippi States, which include Missouri, Arkansas, Oklahoma, Louisiana, and Texas, came next with 10,657 fires. The Northeastern States had 6,251 fires, the Appalachian States 4,827, the East Mississippi States 1,747, the Lake States 3,326, the Rocky Mountain States 3,877, and the Pacific States, 6,842.

Where protective systems were functioning in 1926 nearly 61 per cent of all fires were confined to areas of less than 10 acres, and less than 2 per cent exceeded 1,000 acres. Within the protected areas as a whole the average fire burned 140 acres, as against an indicated average of 337 acres per fire on lands without protection. Of our total forest land area needing protection only about 65 per cent is within the protected area, and the protection afforded ranges all the way from quite thoroughly fire-tight systems on some private, State and National forests down to the merest beginnings of educational preventive effort. On the protected area there were 100 fires per million acres as against 308 fires per million acres of unprotected land. Only 1.21 per cent of the protected area burned while 10.4 per cent of the unprotected land burned over.

ASSOCIATION TO HOLD ANNUAL MEETING AT ST. LOUIS

Announcement has been made that the annual meeting of The American Forestry Association in 1928 will be held at St. Louis, Missouri. This decision was recently reached by a committee of the Board of Directors selected to determine the place of meeting next year. The date of the meeting and details of the program have not yet been decided. They will be announced in a later issue of this magazine.

Pennsylvania Establishes Forest Seed Stations

The first of a series of forest tree seed supply stations to be established on the State Forests of Pennsylvania has been located in the Mont Alto State Forest in Franklin county. Similar areas are soon to be located in other State Forests. These stations are special forest areas set aside for the production of high-quality forest tree seeds, and will be maintained primarily to meet the demand of the State nurseries.

During the past twenty-five years more than one hundred million trees have been planted in Pennsylvania, and to continue with the reforestation program a large quantity of forest seed is needed. Last year the State Department of Forests and Waters purchased 1,000 pounds of pine, spruce and hemlock seed and 1,000 bushels of walnuts, acorns and hickory nuts. These will be planted at the seed stations.

New Hampshire Society Would Save Scenic Forest Area

To save for New Hampshire the six thousand acres of woodland surrounding the "Old Man of the Mountain," the Society for Protection of New Hampshire Forests, at its fifteenth annual forestry conference at Dover, early in September, voted to furnish money to enable the

The timber for future generations is growing today in the Douglas Fir forests

WHEN Chaucer was still a young man, a seed from a ripened cone of Douglas Fir winged its way to the soil.

A fire, set by Indians, had cleared an open space, and here, buried in the surface litter, this seed sprouted and became a seedling, just as countless millions of seeds are sprouting today in the forests of the West Coast in Oregon and Washington.

After this seedling had become a forest giant more than two feet in diameter, the first book was printed. Somewhat later, after the Voyage of Columbus, Balboa looked out over the Pacific Ocean, little dreaming that far to the Northwest this tree and thousands upon thousands of its comrades created a forest wealth that was some day to make the riches of the Indies pale into insignificance.

When the Pilgrim fathers landed at Plymouth this seedling had become a tree that was more than three feet in diameter, proudly thrusting its crown more than two hundred feet into the air.

A few days ago, mature and more than sixty inches in diameter, it was harvested to provide material for homes of durable wood for Americans of another generation. Mature and sound in bole and limb, growth had all but ceased. A few more years and even this giant would have bowed to an immutable law of nature and given way to youth.

A hundred years from now, the last of the trees that were a virgin forest when white men came into the Douglas Fir will have been harvested. Their place will be taken by the young stands that are now twenty, thirty and forty years old, and by the rapid growth of trees that are seedlings today in this evergreen region. For here forestry is practical and new forest wealth can created in a very short time. Commercial timber can be produced in forty years; in even shorter time on the best soils.

"The fundamental idea of forestry is the perpetuation of forests by use".—So spoke Theodore Roosevelt. In building homes of Douglas Fir, Sitka Spruce, West Coast Hemlock and Western Red Cedar, American citizens are making use of the finest construction material that has ever been discovered, and which is at the same time quickly replaceable.

An illustrated booklet on the uses of Douglas Fir and other West Coast woods will be mailed on request. *Address*, West Coast Lumber Bureau, 560 JJ Stuart Building, Seattle, Washington.

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Best Duck and Goose shooting on Currituck Sound. Live Red Head Canvas Back, and geese decoys Guides 10 to 25 years experience. First class rigs. Best of accommodations. Ladies may be entertained as well as gents. Reasonable rates. Excellent board. Located on shore of Currituck Sound at shipping point. Good roads from station. Best of references. Make reservation early. Season November 1st. February 1st.
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State to put through its long contemplated purchase of this scenic and historical tract. The conference also adopted a resolution demanding that the State revise its timber tax laws on an equitable basis and advocated the purchase of the last large stand of virgin spruce in New England, at Waterville, New Hampshire. It further passed a resolution calling upon Congress to pass without further delay the McNary-Woodruff bill.

In 1925, a bill passed the State legislature appropriating $200,000 for the purchase of the timbered hills around the famed "great stone face." This, however, proved insufficient and the area is still unguarded against the timberman's axe and exposed to the danger of forest fires. According to Allen Hollis, president of the Society, the organization has resources which enable it to guarantee the State whatever funds will be necessary to supplement the $200,000 already appropriated. This contribution, however, must be formally accepted by Governor Spaulding.

In addressing the first conference meeting, Professor James W. Toumey, of the Yale School of Forestry, and director of the Yale Forest, near Keene, declared that excessive taxation of standing timber in New Hampshire makes it almost obligatory for the owner to cut his forests if he does not wish to suffer heavy yearly assessments.

"New Hampshire is the most backward State in New England in establishing a body of forest laws under which private forestry can be a profitable undertaking," he declared.

"We in this State are taxing the stands of our fully stocked best stands of timber out of existence and progressively increasing the area of worthless timber which pays little tax. Hundreds of pine lots are cut prematurely in order to escape an excessive and an unreasonable tax. We are paying on our demonstration forest, established and maintained for the public good, an annual tax of seventy-five cents per acre, yet more than ninety per cent of this forest is below mechantable size. Forestry can not endure under this form of taxation."

Ovid M. Butler, Secretary of The American Forestry Association, Washington, D. C., addressed the meeting on the McNary-Woodruff bill. He urged the importance of every one getting behind the measure, individually and collectively.

Among the conference delegates attending the meeting were Governor Spaulding, of New Hampshire; Major R. Y. Stuart, assistant forester, United States Forest Service; W. C. Henderson, associate chief, United States Biological Survey; W. G. Howard, superindent of State forests of New York; Joseph S. Illick, state forester of Pennsylvania; and Arthur Ringland, secretary, National Conference on Outdoor Recreation, Washington, D. C.

Wood Utilization Exhibit at Washington

At the invitation of the Washington Real Estate Board, the national committee on wood utilization of the Department of Commerce, will have an exhibit at the Washington Auditorium October 24 to 29 in connection with the Better Homes Exhibition. Unusual importance is attached to this exhibition because the Capital City is entering upon a Federal building program involving fifty million dollars in new Government department buildings.

The national committee will endeavor to show the most effective and efficient use of forest products in house building and construction. Some of the main features will include demonstrations of construction details and how to eliminate many of the usual flaws in frame construction caused by faulty use of materials. The committee also intends to demonstrate the use of treated lumber for house construction. In fact, the entire range of efficient wood-using practices as pertaining to the building and construction field will be given an expression and their practical application will be shown. Dudley F. Holtman, assistant director of the committee, will arrange the exhibit.

California's Fire Losses

Vigorous prosecution of fire law violators, resulting in 66 convictions, heavy fines and several jail sentences, together with material expansion of the State forest patrol system, have been important factors in reducing California's timber losses to a minimum during the first half of the present season.

Fire losses to date in areas patrolled by State rangers were placed at $216,722.77 in the report to Fred G. Stevenot, Director of the new Department of Natural Resources, with 208,237 acres burned over. Grazing lands burned totaled 166,187.01 acres; grain, 2,052.8 acres; brush, 38,897.70 acres; timber, 1,215.54 acres. The estimated losses, as reported by State Forester Pratt, were: Timber, $1,727; range, $106,526; grain, $20,661.62; improvements, $77,808.15.

Eleventh Artificial Lake for Harriman State Park

Clearing of the site for another artificial lake in the Harriman State Park, New York, has begun in Brooks Hollow, three miles east of Central Valley. It will be on the same drainage as the present Twin Lakes, which are now the center of several girls' camps and on a stream which is one of the headwaters of Popolopen Creek. The lake will be the eleventh in the program of eighteen artificial lakes designed by Major W. A. Welch, chief engineer, when the development of the Harriman Park was begun, fifteen years ago. Work on two others will begin within a few months.

Georgia Stages Fire Line Demonstration

More than three hundred people attended a demonstration of fire line plowing by means of tractors, held at Waycross by the Georgia State Board of Forestry, on August 31. Several companies cooperated to make the demonstration a success and six individual tractors, each carrying separate plowing equipment staged a contest which was judged on points such as time, number of men to operate, amount of work done, fuel consumption and ease of operation.

Strips were laid out on a tract of stump land and each machine on its strip had a big crowd of interested land owners, operators and foresters following it to see what could be done. There were a few short break-downs, a lot of stumps to be dodged; one man got so far ahead that he lost time by passing the last stake, and one drew the strip with a pond which he had to circle near the end of his round.

One company used a road scraper to good advantage but there were more of the heavy disc type of plows than any other. Strips of more than twenty feet in width and a quarter of a mile long were plowed in less than an hour.

Preceding the demonstration, a meeting was held at which R. E. Benedict, of Brunswick, discussed the theory of fire lines; Captain I. F. Eldridge, of Suwannee Forest, told of the experience of his company in plowing lines of primary and secondary character; and Alexander Sessoms, of Cogdell, told of similar work on the tract in which he is interested. Captain Eldridge emphasized the usefulness of line for roads to transport men and equipment in case of fire and said that while they did not fire-proof any tract, they made it possible to stop fire with comperative ease.

Mr. Sessoms discussed the fire at Cogdell last spring which was reported, he said, with a good deal of exaggeration, and that while it was a serious one, less than three per cent of the area under protection was burned over. He declared that it is now in better shape with the trees left than neighboring land which has been burned over every year. This statement was received with interest because this particular fire has been pointed out as an example of the futility of attempting protection without creating an uncontrollable risk in the "rough."

District of Columbia Plants Shade Trees

More than 3,000 shade trees were planted late in September along the streets of the newly developed sections of Washington, D. C. The planting was done under the direction of Clifford L. Lanham, district superintendent of trees and parkings. The new trees were mostly American elms and Norway maples, although a few Sycamores were planted.

J. D. Rue Leaves Madison

J. D. Rue, chief of the pulp and paper section of the Forest Products Laboratory, Madison, Wisconsin, resigned late in September to take up duties as director of research for the Champion Fiber Company, Canton, North Carolina.

Mr. Rue had been directing the pulp and paper section at the Forest Products Laboratory since 1921, and has carried out successfully a number of researches of importance to the pulp and paper industry. Among the studies which yielded notable results were those having to do with the chemistry of the sulphite process, the bleaching of wood pulp, the semi-chemical process and the use of the rod mill as a refiner and beater. Before his connection at the Forest Products Laboratory, Mr. Rue was assistant to the president of the Mead Research Corporation.

Wild Life In New Mexico

Every locality in New Mexico is naturally suited to some form of game, according to a report recently issued by the State Department of Game and Fish. The study was made by J. Stokley Ligon, of the United States Biological Survey.

The abundance of high, rugged, timbered mountains, canyons and mesas throughout the State, except in the extreme southeastern section, has naturally favored game, Mr. Ligon reports. These areas constitute range for a variety of big game, while the lowlands in between provide ample areas for prairie and valley dwelling species.

Deer, turkeys and quail are the principal resident game of the State. Buffalo, elk and sage grouse alone have been exterminated in the wild state. Antelope remain in 22 of the 31 counties and bear were found in 18 counties.

Chinese Elms Thrive Where Few Other Shade Trees Live

For shade or as a windbreak, the Chinese elm has proved its value in most sections of the United States. The United States Department of Agriculture introduced this tree nearly 20 years ago and now recommends it as useful and widely adaptable. It is particularly valuable in regions of light rainfall and extremes of temperature where few trees thrive. Trials indicate that the Chinese elm grows even more rapidly in the relatively dry area of the Middle West than in the moister regions of the Atlantic coast. Trees have weathered the severe winters of the northern tier of States and have made satisfactory growth near Yuma, Ariz., where few shade trees are able to survive the dry climate.

This elm grows with numerous slender, almost wiry, branches. The leaves are eliptical and smaller than those of the American elm. Leaves appear early in the spring and the tree is one of the last to lose foliage in the fall.

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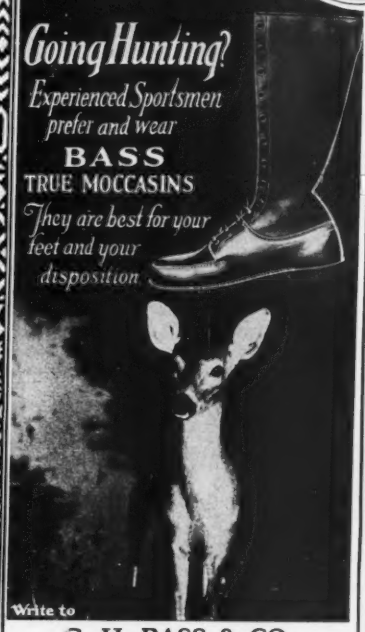

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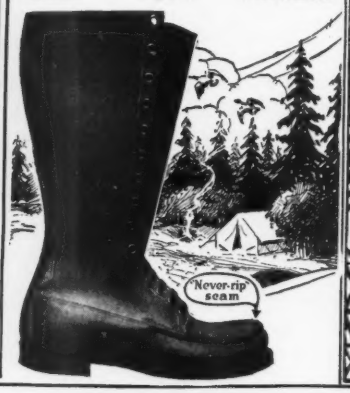

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THE LEADING FOX RANCHES

Starlings As Enemies Of British Forest Workers

By A. Edward Hammond

Starlings are among the pests with which the forestry authorities in Great Britain have to contend, and serious damage has been done by these birds in many plantations throughout the country. One instance is provided by the visitation of a large flock of starlings to a plantation on the Bieton estate in North Devon, belonging to Lord Clinton, which commenced in October, 1922. The plantation concerned, known as the Brickmoor, consists of two tracts of seventeen-year-old larch and spruce. An interesting account of this visitation was sent recently by Lord Clinton to the Empire Forestry Association, of which the following is extracted:

"Many efforts were made to dislodge the birds, by noise, by smoke and by shooting; thousands were killed without any apparent effect upon their numbers. We fired through the trees, bringing down many at one shot, but no other bird would move; a man can pick them off like ripe fruit from the lower branches without causing any of them to rise.

"A thinning was due in 1924 and it was hoped that this would render the plantation less comfortable for them, but the stink was so bad that men could not face the job; every branch was hanging with filth and there was a black slime two inches thick covering the ground. After the very dry June of 1925 it became possible to get to work, and the actual damage done can now be seen. About one-third of the trees are dead and many of the remainder are in an unhealthy state. The spruces have suffered more than the deciduous larch, and in a plantation close by, which accommodated an overflow, the yound Douglas firs have suffered more than any other species.

"The thinning had some effect on the nest infestation, and in November, 1925, it was possible to move them. They migrated to a 20-year-old Scots pine plantation, about a mile further up the valley, where they remained about a fortnight and left a serious mark behind them."

State Forests Increase In Ohio

During the past year more than 11,000 acres have been added to the State forest and park system in Ohio. There are now six State forests and nine forest parks, totaling 35,000 acres. The State forests are the larger areas of wild land within the State, and their use will be varied. They will demonstrate the principles of forest conservation, will serve as a protective cover for the basins of streams and will afford the most excellent opportunities for outdoor recreation. Facilities which will be offered for recreation will in no way interfere with the other operations on the forest, nor will forest operations interfere with recreation. The tracts are so located that they are accessible by good roads from Ohio's centers of population.

North Carolina Counties Add Forest Fire Force

Wilson and Greene counties, in North Carolina, have provided funds for the establishment of an organized forest fire prevention campaign in cooperation with the State and Federal governments.

Five hundred dollars has been appropriated by the commissioners of each county on an all fire fighting contract basis with the State Department of Conservation and Development. Under this form of contract the county agrees to pay all forest fire fighting costs up to the amount of the appropriation and the State agrees to spend the amount of the contract in administration and educational work.

An increase of the appropriation of Lenoir county from $500 to $600 for the present fiscal year is also reported.

Wyoming Foresters Use New Barometer

Elevations at various points in Wyoming were recently checked with an aneroid barometer by officials of the United States Forest Service. The instrument, recently developed, indicated the elevation of Medicine Bow Peak to be 12,011 feet. The United States Geological Survey bench mark on the peak indicated 12,005 feet, Thus, the difference of only six feet between the modern instrument and the old survey has led foresters to believe that the barometer will greatly simplify topographic mapping in connection with forest surveys.

Examinations For Forest Rangers Announced By Civil Service

The United States Civil Service Commission announces an open competitive examination for forest rangers, applications to be filed not later than October 14. The examination is to fill vacancies in the United States Forest Service in twenty-five States in all sections of the country. The entrance salary ranges from $1,620 to $2,500 a year. Full information may be obtained from the United States Civil Service Commission, Washington, D. C.

California Redwood Park Enlarged

The Charles N. Felton grove of giant redwoods in Humboldt County, California, recently was dedicated as part of the State park system, according to *The Timberman*. Mrs. Kate Felton Neilson, daughter of the late United States Senator, purchased approximately one hundred acres of the finest primeval forest and deeded it to the State to stand for all time as a monument to one of California's pioneers. The ceremonies were in charge of Joseph D. Grant, chairman of the executive committee of Save the Redwoods League. The address was delivered by Dr. Ray Lyman Wilbur, president of Leland Stanford University.

Commission Reports On Jackson Hole Elk

That the solution of the problem of the elk of Jackson Hole, Wyoming, demands a complete plan of game management and administration, revised annually to meet the exigencies of the situation as they arise, is the opinion of the commission appointed by the President's Committee on Outdoors Recreation, to study the Wyoming herd. The commission further recommended that this administration and management be jointly agreed upon and executed by the United States Biological Survey, the United States Forest Service, and the Wyoming State Game and Fish Commission.

In its report the commission advocated the creation of an Advisory Board to assist these agencies in the correlation of administrative plans with local and State economic welfare, and to promote public interest. The Board would consist of one member designated by each of the following agencies: The Forest Service, the Biological Survey of the United States Department of Agriculture, the local stock interests of Jackson Hole, the Dude Ranchers' Association, and interested sportsmen's organizations. In addition to executive sessions the report advocated that the Board hold an annual public meeting and hearing for the purpose of reviewing the facts pertaining to the condition of the elk herd during the passing season and making recommendations to the appropriate State and Federal authorities for the administration of the herd for the ensuing season.

The report further recommends a determination of the number of elk of graduated age class and sex that can and should be permanently maintained at Jackson Hole. The commission provisionally fixed this number at 20,000 head. An annual count to determine fluctuations—increase or decrease—from 20,000 head was recommended.

The establishment of an experiment station to make a comprehensive investigation of the life history of the Jackson Hole elk and the factors affecting their maintenance in suitable numbers, and of similar investigations of the Northern Yellowstone, Shoshone, Wind River, Sun River and Green River herds, was also advised. Other resolutions advocated by the commission included the withdrawal from entry of the unreserved, unappropriated public land in isolated tracts surrounded by or contiguous to winter refuges, and the introduction of legislation appropriating funds to purchase additional refuges and provide for equipment, maintenance and operation.

Secretary of War Dwight F. Davis, Chairman of the President's Committee, designated the comission making the investigation, which also included a representative appointed by Governor Frank C. Emerson of Wyoming.

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Rev. A. F. Anderson, F. R. H. S.
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Exploded Wood

(*Continued from page 592*)

Logging operators rarely utilize tree tops and slashings beyond the eight inch diameter limit, due to inability to convert them into commercially profitable products. Aside from a few instances where the operator finds a handy market for posts and firewood, these slashings are left in the forest to decay or are burned to remove fire hazards. The guns of the Mason Fibre Company are not restricted to any such diameter limit. Forest waste may be utilized to the extent of its commercial value as pulp wood. This means a saving of many million feet of timber.

Another thing that may be expected of the process is a possible reduction of the forest rotation. Trees from twenty-five to thirty years old are choice cannon fodder in the Mason process. Thus, the value of cutover land if immediately restocked, is increased materially.

Unfortunately, in Mississippi a high State tax on cutover lands discourages this restocking. It is explained by the operators that it is not economically feasible to hold such lands until the second growth reaches logging size. It is the practice with some companies there to allow cutover lands to revert to the State in default of taxes. Just what effect the exploded wood process will have on this practice is not known, but if a valuable market is created for twenty-five year old trees, ways and means to meet this demand can be expected.

Synthetic lumber as an achievement worthy of exerting a deep economic influence has been profoundly advanced by Mr. Mason's exploded wood process. Further, it may open the door to a new and more rapid method of utilizing waste in the making of paper. But it is more than a technical exploit; it characterizes the trend to closer utilization and conservation of the country's timber resources by progressive-minded people.

New York Planted Redwoods in 1850

What is believed to have been the first propagation of the California redwood in the East has been uncovered at Rochester, New York. According to the realty firm of Ellwanger & Barry, who maintained a nursery in that city from 1840 to 1918, seeds of the *Sequoia gigantea* were received there in 1850 from G. H. Woodruff, a pioneer California miner, who discovered the giant trees in his quest for gold. The seeds were placed in a snuff box and sent East by pony express. The charges for the little package were $25.

Ellwanger & Barry planted the seed in their greenhouses and produced, so far as is known, the first redwoods in the East. More seeds were obtained, and in 1856 about 4,000 young trees had been raised. Four hundred of these were shipped to England and sold as *Washingtonia gigantea*, "the celebrated Big Tree of California." Of the original propagation, seven trees were planted in grounds surrounding the nursery at Rochester and in the summer of 1917 had reached a height of fifty feet. They were killed the following winter by severe cold weather.

Oregon and Washington Get Cooperative Forestry Funds

More than ninety thousand dollars of Federal funds have been alloted under the Clarke-McNary reforestation act to Oregon and Washington for cooperative forest protection during the current fiscal year, according to the United States Forest Service. The Oregon allotment will be $47,455, and the Washington allotment $44,242, a total of $91,697. This is a substantial increase over 1926, which shows expenditures for Oregon $39,139, and Washington $33,220, a total of $72,359. The present allotment is the largest yet made under the Clarke-McNary law. The Clarke-McNary law, enacted by Congress June 7, 1924, authorizes Federal appropriations to help guard State and private forest land from fire.

Virginia Company Adopts Forestry Measures

The Camp Manufacturing Company, with headquarters in Franklin, Virginia, has decided upon continuous production. This means that this company is replacing the old system of clear cutting with that of selective cutting. Young trees below a certain diameter will not be cut and, if necessary, mature seed trees will be left. An intensive protection system, with lookout towers, wardens and logging forces trained to prevent and fight fires has been adopted. This company has 400,000,000 feet of standing pine and 250,000,000 feet of hardwood and is, therefore, in a position to change over to a sustained yield; that is, cutting about what grows rather than the haphazard clean-cut system.

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2-year seedlings	12.00 M.
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5 to 8 in. "	35.00 M.
2 to 3 ft. "	35.00 C.
2 to 3 ft. Spec.	18.00 X.
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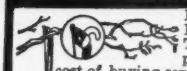

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Census of Forest Products for 1926

The United States Department of Commerce announces that, according to data collected at the annual canvass of forest products for 1926, the production of lumber, lath, and shingles in the United States was as follows: Lumber, 36,935,930 thousand feet, board measure, a decrease of 3.7 per cent as compared with 38,338,641 thousand feet in 1925; lath 3,083,130 thousand, a decrease of 2.5 per cent as compared with 3,161,137 thousand in 1925; and shingles, 6,008,346 thousand, a decrease of 18 per cent as compared with 7,324,027 thousand in 1925.

Of the 46 States reporting the production of lumber for 1926, thirty showed decreases and sixteen increases as compared with the output for 1925, the greatest amount of increase being indicated for Washington, for which State the lumber cut—over 7,500,000 thousand feet—was greater than that reported by any State at any preceding census. Eight other States showed a production of more than 1,000,000 thousand feet for both 1926 and 1925.

Seven kinds of wood contributed more than 1,000,000 thousand feet each to the total cut for each of the two years. The dominating woods, as for previous years, were yellow pine and Douglas fir, which contributed 31.8 per cent and 23.8 per cent, respectively, of the total production for 1926, as against 34.5 per cent and 21.3 per cent, respectively, of that for 1925. Only two of the seven woods of chief importance, yellow pine and white pine, showed decreases for 1926 as compared with 1925. Douglas fir reported the largest increase, 8 per cent.

P. A. Hayward Joins Wood Utilization Staff

Mr. Phillips A. Hayward, Instructor in Wood Utilization at the New York State College of Forestry, Syracuse, New York, has been added to the technical staff of the National Committee on Wood Utilization, Department of Commerce, according to announcement by Axel H. Oxholm, Director of the Committee. Mr. Hayward is a graduate of the New York State College of Forestry and has been actively engaged in the practical end of the lumber industry for eight years. He served with the W. M. Ritter Lumber Company, Columbus, Ohio, the Nichols & Cox Lumber Company, Grand Rapids, Michigan, and with the Chicago, Burlington and Quincy Railroad engaged in wood preservation work. In addition, Mr. Hayward has been engaged in lumber operations of his own in Mississippi and Arkansas, and has had extensive experience in manufacturing and marketing both softwoods and hardwoods in the South and in the Lake States region. Mr. Hayward will devote a great deal of his time to various industrial projects, with particular reference to small dimension stock and short-length lumber.

Elephant Fire Brigade In India

A remarkable story of how a herd of wild elephants conquered a forest fire on the southwest coast of India has been published by the Indian News Service.

It appears that during a gale a big tree was uprooted and blocked the Travancore highway. A crew of natives was detailed to clear the road, and to lessen their work attempted to burn the tree. When darkness came the laborers returned to the safety of the custom house, leaving the fire to spread to the adjoining woods. According to the report, the leader of a roaming band of wild elephants discovered the blaze and immediately called his followers by loud trumpeting. Within a few moments a well disciplined band of dusky four-footed firemen were busily employed with their trunks as hose, turning forty streams of water on the blazing tree and burning woods. A small stream near by was sufficient reservoir for them to draw their supply of water. Perhaps as a matter of revenge, the beasts, after smothering the flames, dragged the fallen tree into the middle of the road and left it there.

Wild Life Progresses in Idaho

During the last four years Idaho has increased her fish hatcheries from four to ten and has established a game farm with an annual output of 5,000 pheasants. A trained fish culturist is employed to supervise the fish propagation work and a gamekeeper is in charge of pheasant propagation.

Commissioner R. E. Thomas has concentrated efforts also on the control of predatory animals and birds, especially cougars and coyotes. It is claimed that the distribution of sulphurized salt has done much to eradicate scurvy and ticks among game animals and that a marked increase in deer and elk has been noted. Caribou, antelope, moose and mountain sheep have all shown an increase, according to the last State and Federal census of game.

Third Ohio Valley Conference On State Parks

The third Ohio Valley Regional Conference on State Parks will be held in Cincinnati, Ohio, October 18 to 20. This meeting is sponsored by the National Conference on State Parks, and its object is to encourage the establishment of State forests, parks and monuments. The meeting will open at the Hotel Alms, where Colonel Richard Lieber, director of the Indiana Department of Conservation, Professor Henry Cowles of Chicago University, Edmund Secrest, Ohio State Forester, and Vance Fratherm, secretary of the Kentucky State Park Commission, will speak. The conference will conclude with a field trip through the Cincinnati parks and a journey to Fort Ancient, one of the largest prehistoric earthworks on the North American continent.

Georgia Forestry Legislation

Through the efforts of the Georgia Forestry Association an attempt to change and weaken the method of financing the Georgia State Board of Forestry, was defeated in the last session of the State legislature which closed August 20. As the revenue bill was drawn, it would have been necessary to secure an appropriation from each legislature instead of having the privilege tax allocated to the forestry fund as collected. An amendment was added to the bill when it was passed correcting this difficulty.

The management of Indian Springs, a state reservation containing valuable medicinal springs near Griffin, was turned over to the Board of Forestry by special act carrying an appropriation of $3,000 for the biennium to cover expenses.

The Forestry Contract Act was defeated. If passed it would have made more equitable the method by which young timber is taxed in the State.

Grouse Scarce In New York

That the ruffed grouse or partridge is becoming scarcer in New York is brought out by W. L. McAtee in a study recently published by the Roosevelt Wild Life Forest Experiment Station at the New York State College of Forestry, Syracuse University.

Mr. McAtee says in this survey of the woodlot birds of New York that the partridge originally occurred in every county in the State but is now scarce in the more thickly settled ones. This bird prefers mixed woods and undergrowth both for cover and for berries and vegetable food. Insofar as welfare of the woodland is concerned the partridge plays a dual role. Its fondness for buds is sometimes a detriment where orchards are invaded, while its taste for insects is a benefit. Half of the bird's food consists of buds and leaves; one-fourth consists of wild fruits and a tenth of various seeds. The buds of poplar, birch, and willow constitute a fifth of the partridge diet. Buds of the alder, hazel, beech, maple, ironwood, and apple are also on the menu of the ruffed grouse, says Mr. McAtee.

Fisher Body Corporation Buys Forests in Louisiana

The Fisher Body Corporation of Detroit, Michigan, one of the largest automobile body manufacturers in the world, has purchased 60,000 acres of hardwood forest in Louisiana. The total volume of timber now owned by this corporation, all acquired within the past three years, is approximately one and one-half billion board feet. This amount, it is claimed, is sufficient to supply the needs of all the automobile manufacturers in the United States for a hundred years, based on the present annual consumption, and would permit the forest to be maintained perpetually.

Fire Prevention Aid For Dismal Swamp Area

Assurance of the launching of the special forest fire protective system embracing a large part of the Great Dismal Swamp area in North Carolina and Virginia is given by developments recently announced in the two States.

In North Carolina, the Camp Manufacturing Company, one of the largest timberland owners, has listed all of its holdings with the State Forest Service at the rate of two cents per acre for the establishment of the protective system. This area consists of approximately 46,500 acres.

Norfolk County (Virginia) commissioners have appropriated $2,000 to make the work possible on that side of the line. This assures the cooperation of the two States in the association work.

W. C. McCormick, Assistant State Forester of North Carolina, declares that plans are now going forward to inaugurate the protective system, which will include the most efficient methods that are in vogue for forest fire prevention and extinction. Three towers are contemplated, two of which will probably be located on the Virginia side and one in North Carolina, giving a comprehensive cross-section view of the area.

On the ground there will be a force of fire wardens, who will be connected by telephone with the towers and who will be available for momentary service when the alarm of a forest fire is given.

The protective area will consist of approximately 170,000 acres, 70,000 of which will be in North Carolina and the remaining part in Virginia. Forest Services of the two States, the Federal Government, various counties and landowners will cooperate in the plan. It is expected that the towers will be erected and the system will be ready for operation before the beginning of the fall fire season.

End-Matching Softwood Lumber

Trade preferences and practices that had their origin in a time when there was less need for close utilization of the country's forest resources, have been responsible for a waste in the manufacture of lumber that can be largely corrected by the popularizing of short lengths. This assertion is made in a bulletin recently published by the National Committee on Wood Utilization, United States Department of Commerce, entitled "End-Matched Softwood Lumber and Its Uses."

Short mill lengths should be made a regular item of retail lumber stocks and the consumer encouraged to buy them, declares the report, which goes on to state that sawmill waste involved in trimming lumber to standard even-feet lengths and in the non-utilization of lumber less than eight feet long is estimated to run between $100,000,000 and $200,000,000 annually.

AXIOMS OF TREE CARE

DR. J. FRANKLIN COLLINS, Forest Pathologist, U. S. Department of Agriculture, expresses sound advice in his publication, **Tree Surgery:** "A badly diseased or injured tree should be removed and replaced by a healthy one unless there is some very special reason for trying to preserve the tree.

"Two axioms of tree-repair work (tree-surgery) that should be borne in mind constantly, are (1) that prompt treatment of freshly made wounds is the surest and most economical method of preventing disease or decay in the future, and (2) that all wounds made in tree-surgery work should be cleaned, sterilized, and protected from infection just as thoroughly as in the case of animal surgery and for exactly the same reasons."

Many valuable trees have been slowly killed by decay and insects working in the trunk and limb wood through cavities.

Unless the exposed wood is kept protected a cavity will continue to increase in size until the entire tree is destroyed and if the open cavity method is used constant treatment is necessary.

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BOOK REVIEWS

PLANT HUNTING, by Ernest H. Wilson, M. V., V. M. H. Published in two volumes by the Stratford Company, Boston, Massachusetts. Price $15.

The "Plant Hunter" is a species of the *genus homo,* who, with botanical thirst whetting his whole being, goes into any nook or crevice of the earth's surface which may offer a new color, shape or growth feature of plant life to the world's knowledge of botany. He gladly courts danger from wild beasts and wilder natives, and with keen enthusiasm gropes his way through dark forests, over high ridges and through malarial swamps. But the satisfaction gained more than justifies the hardships, according to "plant hunter" psychology.

Ernest H. Wilson, keeper of the Arnold Arboretum of Harvard University, dedicates his two volumes on "Plant Hunting" to "those of every race and creed who have labored in distant lands to make our gardens beautiful." His books contain a wealth of information about plants, gleaned from all corners of the world and presented in an intensely interesting and delightful style. All of which is to be expected from one so well known in the world of plant hunting.

The botanical wealth of Africa, Australia, the Tropics and the Orient, is exhibited; botanists of past years, their discoveries and contributions to science, are presented, and the whole is splendidly illustrated by a hundred and twenty-eight photographs, mostly from the author's own collection.—G. I. N.

Massachusetts Boosts Wild Life Conservation

To undertake conservation problems that can best be approached by the combined efforts of interested organizations, Massachusetts has formed an associated committee for wild life conservation, made up of representatives from the Massachusetts Audubon Society, the Massachusetts Fish and Game Protective Association and the Federation of the Birds' Clubs of New England. This does not mean a consolidation of the three organiations, as each will continue its separate identity, but the creation of a board to study problems of general interest.

The personnel of the committees is as follows: Representing the Audubon Society, Francis H. Allen, Charles B. Floyd, Mrs. Robert B. Greenough, Ralph Lawson, Robert Walcott, George C. Warren and Mrs. Sidney M. Williams; repreesnting the Fish and Game Association, Frank W. Hallowell, Robert A. Leeson, John C. Phillips, John L. Saltonstall and John E. Thayer; representing the Federation, Gorham Brooks, Laurence B. Fletcher, Edward H. Forbush, Harris A. Reynolds and Charles L. Whittle.

Boundary Line Trees

(*Continued from page* 584)

upon the land of another is a trespasser and liable in damages to the owner. It has been held that the damages caused trees is the difference in the fair cash value of the property immediately before and immediately after the injury. (158 Ill. App. 473.) In 141 N. Y. S. 838 the higher Court rendered a verdict of $350 damages against a trespasser in compensation for the destruction of four elm trees that were valuable for their shade.

In many cases the measure of the damages allowed by the Courts is treble the actual damage, particularly where it is shown that the injury was accomplished maliciously. Generally speaking, trees growing in a city street are under the control of the city and the officials may have them cut down, without notice to the owner, in order to make room for a sidewalk or other public improvement. (155 App. Ill. 37.) On the other hand, it has been held on numerous occasions that shade trees growing along a street or highway belong to the adjoining property owner and cannot be cut down by officials unless they are an actual obstruction to the travel. (46 Io. 66.)

Tree Cavities

(*Continued from page* 599)

inent arboriculturists and are being used to a much greater extent each year by tree repair men.

In his "Manual of Tree Diseases," Dr. W. Howard Rankin, of Cornell University, a leader in the field of tree care, sums up the chapter on tree surgery as follows: "The fact to be kept in mind, however, is that most tree surgery becomes necessary only because small injuries were not cared for. Proper pruning, wound dressings, bracing, bolting, chaining, guying and all such operations are necessary to prevent injuries. If such points are given attention, very little surgical work need be done." There is the substance of the whole problem of tree care.

Bird Surgeons

Certain birds are said to possess a wonderful knowledge of the principles of surgery, says the *West Virginia Game Bulletin*. The woodcock, the partridge, and some others are able to dress their wounds with considerable skill. A French naturalist says that on several occasions he has killed woodcocks that were, when shot, convalescing from wounds previously received. In every instance, he found the old injury neatly dressed with down plucked from the stem of feathers and skilfully arranged over the wound, evidently by the long beak of the bird. In some cases a solid plaster was thus formed.

Louisiana Dedicates Forestry School

The new buildings on the one thousand-acre forestry tract donated to the Louisiana State University by the Great Southern Lumber Company at Bogalusa, Louisiana, were recently dedicated. These buildings will be used for summer forestry classes and for field observation during the regular school term.

Colonel A. T. Prescott, dean of men and chairman of the building committee of the university, in his address of dedication, declared that the new forestry acquisition would do more in aiding the development of Louisiana than any step the university has taken in years. Colonel W. H. Sullivan, vice-president and general manager of the Great Southern Lumber Company, assured the university of the continued help and support of the lumbermen and emphasized that the timberlands, mills, laboratories and all other facilities of the Great Southern Lumber Company were at the disposal of the forestry students at all times.

Naval Stores Long Used in America

The manufacture of rosin or the naval stores industry as it is known commercially, dates back to pre-revolutionary days. The name naval stores is really a misnomer that dates to the time when turpentine, tar and pitch were used extensively for caulking sailing vessels, principally for the navies. Rosin was thrown away then but today the by-product rosin creates the greatest revenue. Rosin is produced from long-leaf yellow pine, *Pinus Palustris*.

The naval stores or rosin belt comprises the following states: North and South Carolina, Georgia, Florida, Alabama, Louisianna, Mississippi and a portion of Texas.

The production commenced with North Carolina and is gradually working westward. Today the center of production is Alabama, Florida being the largest producer.

The movement West is due to the cutting of the forests of the Atlantic states for lumber.

Delaware Forestry Commission Complete

With the appointment of Dr. G. Layton Grier, of Milford, and J. C. Darby, of Frederica, the Delaware Forestry Commission, created under the forestry bill recently signed by Governor Robert P. Robinson, has been completed. George W. Butz, Jr., of Wilmington, a graduate of the Biltmore School of Forestry, and Williard Springer, Jr., of Wilmington, a graduate of the Yale School of Forestry, were appointed immediately after the bill was signed.

The new forestry measure repeals the law which gave forestry powers to agricultural cooperation in forest protection with individuals and counties. In addition to the non-salaried forestry commission of five members, including the governor, the bill provides for a state forestry department and the employment of a technically trained forester.

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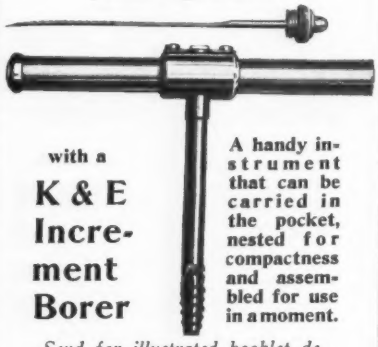

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Preservative Treatment of Wood Increasing

The wood-preserving industry in the United States is growing steadily, according to the United States Forest Service. Statistics for the year 1926, the latest that have been compiled, show that 289,322,079 cubic feet of wood was treated with preservatives, as compared with 274,474,538 cubic feet in 1925. Last year a total of 226,628,746 gallons of preservatives were used in the treatment of timber to prevent decay and prolong its usefulness.

The wood treated with preservatives during 1926 included 187,963,614 cubic feet of crossties, 49,511,088 cubic feet of poles, 31,147,287 cubic feet of construction timbers, 12,420,977 cubic feet of piles, 3,689,424 feet of wood blocks, 1,344,406 feet of cross arms and 3,245,283 cubic feet of miscellaneous wood products. The preservatives used during the year included 185,733,180 gallons of creosote, 13,317,022 gallons of petroleum, 2,541,563 gallons of paving oil, 24,777,020 gallons of zinc chloride and 259,961 gallons of miscellaneous preservatives.

At the close of last year there were in existence in the United States 187 plants for the preservative treatment of wood in various forms. Of this number, 180 were in active operation and 7 idle. During the year 14 new plants were constructed. There were 13 more plants in operation in 1926 than in 1925.

Salvaging Chestnut Stumps For Tannin

Expert authorities predict that within the next 15 to 20 years the chestnut blight will have killed or diseased practically all American chestnut trees in this country. With the wiping out of the chestnut stand will go the source from which at least one-half of our domestic supply of tannin is now obtained—the wood of the chestnut tree.

Recent experimental studies by the Bureau of Chemistry, United States Department of Agriculture, have shown that both the bark and wood of the stumps and roots are relatively rich in tannin. Root bark may contain as much as 25 per cent, while the root wood varies from 9 to 23 per cent in tannin content. These results would indicate a yield of tannin from roots and root bark of approximately twice as much as that from the commercial run of wood from the trunks and branches.

Because of the rapid development under normal conditions of excellent second growth from chestnut stumps it might be considered unwise to advocate the removal of these stumps. This argument, however, is overcome by the knowledge that the chestnut stand is destined for ultimate ruin by the blight. In later years, after the supply of living chestnut wood has been seriously depleted, the stumps and roots may be worth salvaging.

Black Walnuts To Line Kentucky Highway

Eight miles of black walnut trees have been put out on the Memphis to Bristol highway through Washington County, Kentucky, from Telford to a point east of Jonesboro. This project was handled by the Jonesboro Kiwanis Club.

In choosing black walnuts for this planting it was pointed out that this tree thrives especially well in Washington County and that it is economically important for its nuts. It is stated that there will be shipped this year from Washington County alone, not less than 350 barrels of black walnut kernels worth $35,000. This means an industry of no small size upon which many Kentucky people depend for a livelihood.

Canada Takes Lead In Newsprint Production

World leadership in newsprint manufacture in 1926 went to Canada, according to the News Print Service Bureau. In that year the United States, which in 1925 had a slight lead over Canada, increased its output 10 per cent; but the Dominion went ahead with an increase of 24 per cent. The figures given by the bureau are: Canada, 1,882,000 tons; the United States, 1,687,000 tons. Newfoundland, with a gain of 93 per cent over its record of the preceding year, produced 186,000 tons in 1926.

Of the record-breaking Canadian production 88 per cent was imported into the United States. With this huge addition to the domestic output, practically all of which was kept within the states, and other imports totaling 193,140 tons, the United States accounted for 56 per cent of the world consumption of newsprint in 1926. Overseas importations to the United States showed a decline, as they have done each year since 1923.

The per capita consumption in the United States, according to estimates of the News Print Service Bureau, in 1926 reached the remarkable figure of 58 pounds. The increase over the 52 pounds per capita consumed in 1925 is said by the bureau to be due to growth in both the size and the circulation of newspapers.

Russian Lumber Exported to the United States

Preparation for the importation of Russian soft woods and hard woods are being made by concerns representing some of the largest Russian corporations. The success of the Finnish mills in introducing their product in the American market has led the Russian exporters to believe that their lumber should meet with equal success. As in the case of the Finnisl. importations the Russian product will be imported in competition with northern white and Pondosa pine.

Migratory Birds Increasing Says Biological Survey

It is believed that many migratory birds are increasing as the result of protective legislation by the Federal Government and by States, Talbott Denmead, Deputy Chief Game Warden of the United States Biological Survey, told the Izaak Walton League convention at Peterboro, New Hampshire, early in September. He also urged better enforcement of the existing laws; curbing of the "bootlegging" of ducks killed unlawfully; further provisions for wild life refuges and discouragement of drainage projects where the gain to agriculture will not offset the loss of the birds and other wild life, to public welfare.

Of the game birds listed as surely on the increase in recent years, Mr. Denmead mentioned wild geese, canvasback, mallard, redhead, wood and black ducks, whistling swans, pintails and coots. Where observers have thought these birds to be decreasing, he believes it is usually traceable to a change in habits or feeding grounds. A few birds, such as black-bellied and golden plovers, and yellowlegs, have not increased as rapidly as was hoped, and it has been necessary to close the season on these species. Woodcock have been better protected by a recent reduction of the bag limit. The woodcock, Mr. Denmead believes, would have been nearly, if not quite, extinct if it had not received Federal protection when it did.

Preservation of the migratory birds, the deputy chief warden credits largely to the cooperation of the States in enforcing the Federal statutes of 1913 and 1918. Nominally, the Biological Survey is charged with enforcement of the Federal legislation but Congress has never appropriated funds for more than 25 to 30 wardens to cover 48 States, so that little could have been accomplished without the cooperation of the States, the assistance of the State game authorities and the good will of the public.

For better enforcement Mr. Denmead suggested the need for at least one full-time United States game warden in every State and two in the larger States, where there are many violations. He also mentioned with approval the bill that has been before Congress to provide game refuges through the cooperation of the State and Federal authorities. States cannot handle the refuge problem alone, he said. It must be done by the Federal Government, with the assistance of the States.

Airplane Fire Patrol In Colorado

To assist in guarding the forests along the eastern slope of the Continental Divide in Colorado, the United State Forest Service has enlisted the cooperation with the Colorado Airways, Incoroprated, a commercial flying concern, and the One Hundred and Twentieth Observation Squadron of the Colorado National Guards.

Park Saves Swiss Birds

The Helvetian Yellowstone Park, known as Parc National, located on the Schera and Cluoza ranges, near Geneva, Switzerland, is proving a salvation to animal and bird life, according to a foreign correspondent of the *Philadelphia Public Ledger*. The latest census of wild life in the Swiss National Park sanctuary shows there are 99 stags, 1,700 does, 1,410 chamois, 3 eagle nests, 117 foxes and 2 wildcats.

French Adopt United States Rosin Standards

The French trade has adopted as official for French rosin the color value and nomenclature of the United States rosin standards from B to WW, inclusive, according to a report by Dr. F. F. Meitch, in charge of naval stores control, United States Department of Agriculture. Until recently the naval stores trade in France has been without definite and permanent standards for rosin. Through cooperation and correspondence with G. Dupont, director of Pine Institute, of France, and as a result of placing a set of the United States rosin standards in the hands of the American consul at Bordeaux, France, agreement on these standards has been reached by the American and French naval stores industries, laying the foundation for international standards for rosin.

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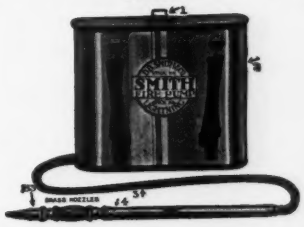

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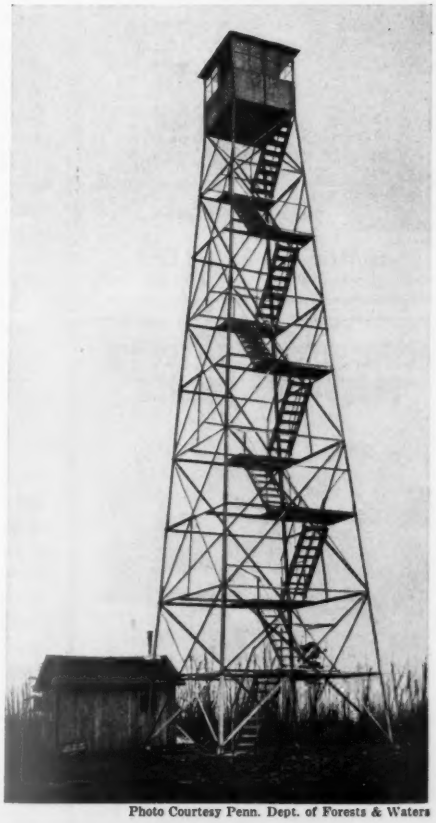

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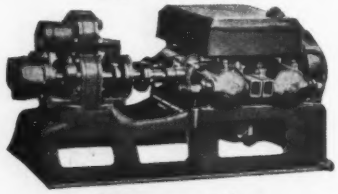

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Sky Dusting the Hemlocks

(*Continued from page* 588)

with a mortality rate of about sixty per cent.

The Wisconsin Conservation Commission states that, including the preliminary flights, the total cost of this experiment was $5,035.05. This amounts to an average of $7.04 per acre for labor and material for the 715 different acres covered at full dosage. It is considered very moderate when compared either with the value of the trees saved or with the cost of dusting from land machines. While the cost could perhaps be lowered in the future by omitting any trial trips or reducing their number, the writers have reason to believe that the contract, involving bringing a plane and crew nearly five hundred miles, keeping it in Door county ten days, and making over sixty flights at full load, was not a profitable one for the company, and that, in all probability, the cost of dusting forests with insecticides will usually be greater than this figure.

From every standpoint this investment is thoroughly justified. Perhaps if aviation had developed earlier the millions of board feet of western fir and hemlock destroyed by spanworms on the Pacific coast could have been saved.

Advances along this line mean that forest owners can in the future protect their holdings from destruction by leaf-eating insects wherever the infestation is discovered in time and whenever the benefits will justify a very reasonable expenditure per acre.

In particular, the directors of forest parks established for the recreation and enlightenment of the public, where the maintenance of vigorous and healthy trees is worth far more than their timber value alone, are provided with a new means of protecting the beauty and usefulness of the public property within their care.

New Bird Refuge Created In Oregon

By recent Executive order the McKay Creek reclamation project reservoir, Umatilla County, Oregon, together with small legal subdivisions of adjoining land, has been made a Federal bird refuge, under the administration of the United States Biological Survey. This reservoir, about six miles southwest of Pendleton, will provide a good resting place for waterfowl, even though the refuge itself is not a good feeding ground. There are excellent feeding grounds in the adjacent region, however. The lands included in the refuge are under the jurisdiction of the Department of the Interior for reclamation project purposes, and the reservation of them as a bird refuge is subject to the use thereof by that department, including leasing for grazing, and to any other valid existing right.

Power or Parks on the Potomac?

(*Continued from page* 598)

jurisdiction of the Federal Power Commission. At the short session of Congress in 1920-21 such an amendment exempting all existing National Parks was passed and is now a law. Every act of Congress creating National Park areas since then has contained a clause exempting them from the development of water power.

The importance of the Potomac River Park to the seat of Government of the United States would justify a similar exemption from power development. No preliminary permit should be issued for power along the Potomac until the newly-created National Capital Park and Planning Commission has definitely set aside the land which should be included in the park system of the Federal City and its environs. Therefore, even if the Potomac River Corporation had shown a public demand for power, which it certainly did not do, there would still be a strong case for protecting the proposed Potomac River Park which, it is hoped, will be the admiration and joy of future generations.

Maryland Defines Sinkbox Areas

In order to clear up any doubt in the minds of sportsmen as to where a sinkbox may be used in Maryland waters without violating either the Federal regulations or the new State game laws, officials of the United States Biological Survey, which enforces the migratory-bird treaty act and regulations, have conferred with the Maryland State game warden, and it has been decided that sinkboxes may be used without violating either law if they are placed more than 700 yards from the shore and 700 yards from one another, in the places defined as follows:

On the Susquehanna Flats, consisting of all that portion of Chesapeake Bay south of a line drawn from Concord Lighthouse: in Harford County, to Carpenters Point on the western shore of Cecil County and north of a line beginning at the lighthouse at Turkey Point; in Cecil County, and drawn westerly to a point half a mile north of the northerly part of Spesutie Island; thence still westward but at no time approaching nearer than half a mile to the northern end of Spesutie Island and the adjacent mainland until it reaches the Harford County shore at Oakington.

On the waters of Chesapeake Bay within Queen Anne and Talbot Counties; in the waters of Honga River and that part of Tar Bay above a line drawn from the southern end of the bridge between Upper and Middle Hoopers Island until it strikes the Barren Island Bar; in the waters of Isle of Wight Bay and Chincoteague Bay in Worcester County.

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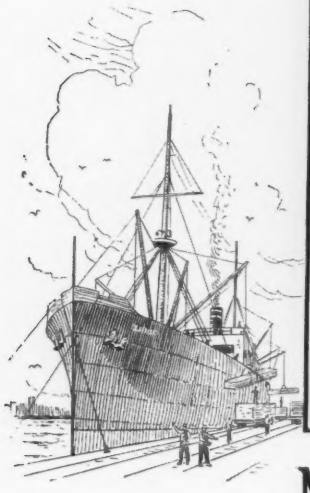

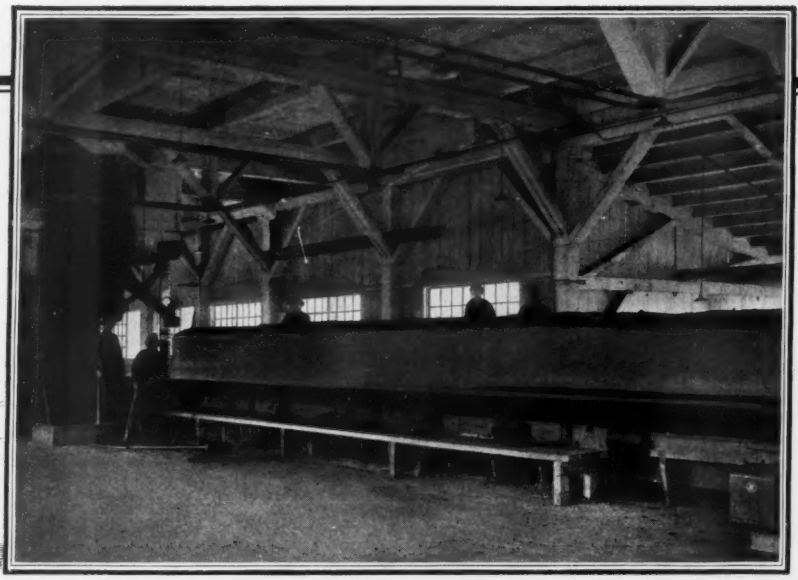

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